Strategic Sustainability Management for Enhancing Corporate Value
– in the context of Korean Business Circles

Strategic Sustainability Management for Enhancing Corporate Value – in the context of Korean Business Circles

Strategisch duurzaamheidsmanagement voor versterking van de ondernemingswaarde – in de context van het Koreaanse bedrijfsleven

Thesis

to obtain the degree of Doctor from the
Erasmus University Rotterdam
by command of the
rector magnificus

Prof.dr. S.W.J. Lamberts

and in accordance with the decision of the Doctorate Board

The public defence shall be held on

Thursday 25th of October 2007 at 13.30 hrs

by

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Acknowledgements

This dissertation would not been possible without the personal and professional support of many people. It gives me a great pleasure to thank them here and to acknowledge their input into this project.

Above all, I am extremely grateful to Prof. Dr. Wim Hafkamp, Prof. Dr. Jan Japp Bouma, and Prof. Dr. Don Huisingh, who have guided my Ph.D dissertation. They constructively channeled with enthusiasm and encouragement the long creative process of this dissertation. I benefited greatly from our numerous discussions regarding my Ph.D dissertation. Their insightful criticism and extensive feedback have been enormously challenging and stimulating. Their theoretical and methodological guidance has been substantial in shaping this dissertation and has definitely strengthened my skills in academic research. Especially, with the help of proofreading with religious care of Prof. Dr. Don Huisingh, my Ph.D dissertation must be greatly advanced. I also thank Prof. Dr. G.I.J.M. Zwetsloot and Prof. Dr. Drs.F.H.A. Janszen of the dissertation committee for their evaluation and approval of the manuscript.

Prof. Dr. Byung-Wook Lee deserve a special mention for having given me a chance to enter the doctoral program at the Erasmus University of Rotterdam and for having provided a stimulating research strategy and research methodology for a great part of the dissertation. I am also very grateful for his intellectual participation in my Ph.D dissertation.

Heartfelt thanks are given to Prof. Dr. Leo Baas, for the arrangement of the Intensive Course, encouragement, and his faithful translation of the English Abstract into Dutch. I also give my thanks to Ms. T. De. Groot for miscellaneous administrative tasks during Ph.D journey

I am especially indebted to my colleague at the POSCO Research Institute in the course of my Ph.D journey. Kih-Yoon Jang, Yoon-Hee Lee, and Yoon-Jung Chin have lots of time for discussions, sharing of ideas, and co-work of projects in POSRI, They played an essential role in the finalization of this dissertation. I will remember with pleasure the exchange of ideas and the social activities with Masa Suzuki at the Erasmus University of Rotterdam in 2005. Especially, I am greatly gratitude for POSRI CEO and Directors, who give me a chance and a sabbatical year for my Ph.D journey.

Closer to home, I wish to express warm thanks to my family, my parents, my father- and mother-in-law, and other relatives, for their love and support at distance. They unfailingly believed in and encouraged me, providing me with roots and wings. Especially, I would like to present my dissertation to my late father-in-law. Finally, this journey would have never been completed, and very liked would have never been started, without my wife, Mi-Kyung Shin, and my daughter, Joo-Bin Ahn. Words cannot express my gratitude for their understanding, care, and love. This dissertation is dedicated to both of them.

Abstract

In line with the growing importance of Corporate Sustainability Management (CSM) in business circles, the linkages between CSM, corporate values and performance is becoming increasingly higher on the agenda both for internal corporate management purposes and for external relations for corporations. To deal with this subject, academic researcher, practitioners and international organizations have elaborated schemes and tools designed to assist corporate leaders to make progress in CSM. These schemes and tools are mainly focused on the collection of evidence and development of recommendations for action. This process is supported by usage of newly developed SD, coaching tools and valuation processes that are, designed to help the businesses to make the business case for CSM. Among the methodologies, this dissertation author relied mainly on 'collecting evidence and broad recommendations based upon action' methodologies; since it is very important to understand the relationships between strategic sustainability management and corporate values. In particular, the author shows that this approach is a sound way to work within the Korean business circle considering its lack of data and limited CSM experiences.

This dissertation author identified and evaluated the key factors of CSM, based upon the definition developed to answer **Research Question 1**(**What factors are generally considered for strategic corporate sustainability in Korean business circles?**). The author then performed empirical studies on three Korean companies to obtain insights into the effects of the selected Korean company's strategies for enhancing their competitivity. SWOT analyses were performed to ascertain the qualitative effects of the companies' CSM programs. This process helped the author to obtain answers to **Research Question 2**(**Is the direction of corporate sustainability strategy in Korean companies appropriate for sustainable growth of the companies?**).

In addition, the author analyzed whether business activities of the three Korean companies actually contribute to their value from CSM perspectives (**Research Question 3**: **Why have Korean companies tried to integrate sustainability into corporate sustainability?**).

To understand the Research Questions from the theoretical perspectives, the author examined and discussed the theoretical background for corporate sustainability management (CSM) As a theoretical perspectives in order to enhance corporate value based on CSM, the author strived to integrate Industrial Organization model with Resourced based model. In addition, the Plan-Do-Check-Act model should be utilized as the theoretical foundations. However, in order to apply the theoretical perspective to the dissertation, the author argued that the firm must efficiently internalize external costs (social costs) related to sustainable development, so that social costs by environmental pollutants and labor condition will be minimized (see Figures 2.5 and 2.6).

On the basis of theoretical perspectives for the dissertation, to obtain answers to the Research

Questions, the dissertation author then investigated the concepts and functions of five pillars for CSM, which include: sustainable development, environmental management, corporate social responsibility, stakeholder engagement, and corporate accountability. It was found that understanding the five pillars is helpful for defining CSM and the core indicators (see section 4.2) and assisted in searching the driving forces for each indicator (see 4.3 section) (Research Question 1). In addition, based on the definition of five pillars for CSM, It, ultimately, provided the basis for the author to develop the 'Corporate Value Matrix for Sustainability (CVMS)' for the empirical study (see section 4.4).

In Chapter 5, the author presents results of the three Korean Company case studies, based on the CVMS presented in Chapter 4(Research Question 2, 3).

The dissertation provides a summary and discusses the findings drawn from current insights into Corporate Sustainability Management (Chapter 4) and from the empirical study (Chapter 5), in section 6.2. Limitations of the dissertation are presented in Section 6.3 and additional research directions and topics worthy for future studies are proposed.

The table of contents is as follows: Chapter Ⅰ describes the introduction of the dissertation including background, motivation and research questions, Chapter Ⅱ explains the theoretical perspectives and method in the study, Chapter Ⅲ examines state of the art in Korean firms in sustainability perspective, Chapter Ⅳ defines corporate sustainability management and establishes CVMS model for current insight for corporate sustainability management, Chapter Ⅴ conducts empirical studies, mainly focused on the three Korean firms' sustainability management, and Chapter Ⅵ provides the findings and discussion including further study.

Rorte Weergave
Samenvatting

In overeenkomst met het groeiende belang van Corporate Sustainability Management (CSM) in het bedrijfsleven, komen de verbanden tussen CSM, bedrijfswaarden en uitvoering in toenemende mate voor zowel interne bedrijfsmanagement doelen als externe bedrijfsrelaties hoger op de agenda te staan. Om met dit onderwerp te kunnen omgaan, hebben academische onderzoekers, praktijkmensen en internationale organisaties schema's uitgewerkt en instrumenten ontworpen om bedrijfsmanagers te helpen om in CSM vooruitgang te boeken. Deze schema's en instrumenten zijn vooral gericht op het verzamelen van inzichten en het ontwikkelen van aanbevelingen tot actie.

Dit proces wordt ondersteund door nieuw ontwikkelde Duurzame Ontwikkeling begeleiders instrumenten en waarderingsprocessen, die zijn ontworpen om de bedrijven te helpen een CSM business case te maken. In dit proefschrift gaat de aandacht uit naar methoden van het verkrijgen van inzicht in en het doen van brede aanbevelingen over de relaties tussen strategisch duurzaamheids management en ondernemingswaarden. De door de auteur ontwikkeling benadering wordt toegepast binnen de Koreaanse ondernemerskringen waarbij er een tekort is aan gegevens en beperkte CSM ervaringen.

In dit proefschrift herkent en evalueert de auteur de sleutelfactoren van CSM, gebaseerd op de definitie speciaal ontwikkeld ter beantwoording van Onderzoeksvraag 1.

Onderzoeksvraag 1: Welke algemene factoren zijn bepalend voor de vormgeving aan Corporate Sustainability in het Koreaanse bedrijfsleven?

De auteur heeft op basis van een empirisch onderzoek bij drie Koreaanse bedrijven het effect van CSM op de strategie ter verbetering van de concurrentiepositie van de geselecteerde Koreaanse bedrijven geanalyseerd. SWOT analyses zijn uitgevoerd om de kwaliteit van de effecten van de CSM-programma's van de bedrijven vast te stellen. Dit proces heeft de auteur geholpen bij het verkrijgen van antwoorden op de tweede onderzoeksvraag.

Onderzoeksvraag 2: **Is dit de richting van Corporate Sustainability Management in Koreaanse bedrijven passend voor duurzame groei van de bedrijven?**

Daarnaast, analyseerde de auteur of bedrijfsactiviteiten van de drie Koreaanse bedrijven daadwerkelijk bijdroegen aan hun waarde voor CSM vooruitzichten.

Onderzoeksvraag 3: Waarom hebben Koreaanse bedrijven geprobeerd duurzaamheid te integreren in Corporate Sustainability?).

Om vanuit theoretisch perspectief de onderzoeksvragen nader te doorgronden, heeft de auteur de

theoretische achtergrond voor CSM bestudeerd en bediscussieerd. Theoretische perspectieven ter verbetering van de gezamenlijke waarde gebaseerd op CSM, de auteur spande zich in voor integratie van het *Industrial Organization model* met *Resourced Based model.* Bovendien zal het *Plan-Do-Check-Act model* gebruikt worden als theoretische basis. Echter, teneinde het theoretische perspectief toe te passen in het proefschrift, onderbouwde de auteur dat het bedrijf zich effectief eigen maakte met externe kosten (sociale kosten) gerelateerd aan duurzame ontwikkeling, zodat sociale kosten door milieuvervuilers en arbeidsomstandigheden minimaal zijn (zie fig. 2.5 en 2.6).

Op basis van theoretische perspectieven voor het proefschrift, ter verkrijging van antwoorden op de Onderzoeksvragen, onderzocht de auteur de concepten en functies van vijf pijlers voor CSM, zijnde: duurzame ontwikkeling, milieu-management, gezamenlijke sociale verantwoordelijkheid, belanghebbende betrokkenheid en gezamenlijke verantwoordelijkheid. Gebaseerd op onderling relaties tussen de vijf pijlers is het nuttig om CSM en de kernindicatoren vast te stellen (zie sectie 4.2) en het draagt bij aan het zoeken naar stuwende krachten voor elke indicator (zie sectie 4.3) (Onderzoeksvraag 1). Daarnaast, gebaseerd op de definitie van vijf pijlers voor CSM, leverde het, uiteindelijk, de basis voor de auteur om het ‘’Corporate Value Matrix of Sustainability (CVMS)’. Met behulp van deze matrix is de empirische studie uitgevoerd(zie sectie 4.4).

In Hoofdstuk 5 presenteert de auteur de resultaten van de drie Koreaanse bedrijfscasestudies, gebaseerd op het CVMS, gepresenteerd in Hoofdstuk 4 (Onderzoeksvraag 2, 3).

Het proefschrift bevat een samenvatting en bediscussieert de bevindingen komend uit recente inzichten in Corporate Sustainability Management (Hoofdstuk 4) en vanuit de empirische studie (Hoofdstuk 5), in sectie 6.2. De beperkingen met het oog op de generaliseerbaarheid van de inzichten van het proefschrift, zijn gepresenteerd in sectie 6.3. Aanvullende onderzoeksrichtingen en onderwerpen voor verdere studies worden voorgesteld.

TABLE OF CONTENTS

List of Tables

List of Figures

CHAPTER 1. INTRODUCTION

1.1 Background for this dissertation

A series of cases including an Exxon-Valdez oil ship's contamination of the Gulf of Alaska in 1989, allegations of forced child labor against Nike in 1998, window dressing settlement of accounts of Microsoft, WorldCom, Enron etc. in 2000, as well as genetic manipulation by Monsanto in 2003, have highlighted that strategic management which considers non-financial issues such as transparency in governance, environment, human rights and community affairs is gradually becoming more important for corporations. Merck[1], which has been grown rapidly through strategic investments in the fields of education and training, medical services, community, environment was awarded "The Most Respectable Company'' by Fortune Magazine between 1987 and 1993. This demonstrates that traditional strategic management which focused only on financial profit is no longer the best way for multinational to continuously prosper in this rapidly changing world.

These cases provide evidence that non-financial issues have been cardinal in corporate strategic management for sustainable growth (which can be attained on the basis of sustainable competitive advantage). Pollutants, that exceed the earth's self-cleansing capacity, cause serious social problems such as poor human health and poverty; consequently a diversification of corporate stakeholders, particularly the emergence of stakeholders who have interests in corporate management with a different point of view regarding the purpose of the corporation - are some of the key elements of these new business circumstances.

In the meantime, a wide range of studies in the strategic management area have been conducted to integrate non-financial issues into business decision-making to enhance overall corporate value. Even though Barney(1991), Porter(1996), and John Elkington(1997) developed strategic management concepts which were directly related to Corporate Sustainability Management(hereafter, CSM) concept based on the three elements of sustainability (economic, environment, and society), many researchers in 1990s had placed primary emphasis only upon only environmental issues (e.g. Harts, 1995); more recently many researchers have begun to proactively consider social issues with environmental issues in the area of strategic management. In addition, a group of practitioners have been striving to understand and manage the relationships between financial performance and non-financial performance like non-financial economic factors, environmental factors, and social factors (see Table 2.4, 2.5, and 2.6).

The author of this dissertation has evaluated evidence for and against the premise that non-financial

[1] In 2004, Merck's philanthropic contributions totaled $979 million, consisting of cash ($58 million), for a patient assistance program ($490 million), and product donations ($431 million), technical expertise and program management. Compared their contributions in 1998, it was increased almost 4 times, when their total contribution was $267 million which, consisted of cash ($37 million), patient assistance program ($46million), product donations ($184million)].

performance is highly related to corporate value and thus, to long-term corporate sustainability. To deal with this objective, the author provides the definition and concepts and the evolving framework for strategic sustainability management (See figure 4.8). This should provide the insight into the current development in corporate sustainability management.

Furthermore, the author presents a framework in the dissertation that provides the conceptual matrix of the Triple Bottom Line (TBL)[2] relationships from a strategic decision-making perspective.

Additionally, this dissertation author performed empirical studies in order to verify whether the efforts of Korean companies for strategic sustainability management are appropriate for their sustainability. This research was performed to obtain relevant empirical evidence to test if their sustainability management is adequate to enhance their corporate values from the TBL perspectives.

Detailed literature review performed on the academic literature pertaining to the relevant fields for this dissertation is presented in chapters 2 and 4. This chapter mainly focuses on past and current development of international organizations and business societies pertaining to the TBL.

1.1.1 The emergence of a Sustainability Philosophy

The industrialization and urbanization since the Industrial Revolution with rapid population growth have led to such environmental degradation that the earth's ecosystems cannot degrade the pollutants through their natural mechanisms. The severity of the pollution problems has led some intellectuals like members of 'the Club of Rome' to conclude that economic growth will be faced with severe limitations, and furthermore, that survival of mankind itself is in doubt[3]. Rachel Carlson warned in the early 1960's that a wide range of pesticides, which had been invented to increase food supply and to protect humans from diverse diseases, could, on the contrary, curb the increase in total food production and lead to increases in human diseases.

Beginning in the 1970s, rapid population growth, resource depletion and environmental pollution became leading issues for which mankind started seeking solutions. To address these challenges, the United Nations established the "Environmental Program"(now called UNEP) in 1972 to cope with environmental pollution comprehensively and systematically, and promoted the provisions of the "Stockholm Declaration" (or "Stockholm Declaration on the Human Environment"), urging governments around the world to propose countermeasures.

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[2] A situation where companies harmonize their efforts in order to be economically viable, environmentally sound and socially responsible, or a framework for measuring and reporting corporate performance against economic, social, environmental parameters (John Elkington, 1997)

[3] The Club of Rome (1972), by Donella H. Meadows, Dennis l. Meadows, Jorgen Randers, William W. Behrens III, argued "if the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years.

However, liability issues for environmental accidents caused friction between developed countries and developing countries, particularly with the Third World countries (77 nations). They argued that environmental liability of the present generation must be paid by the developed countries. Unfortunately, the 'Declaration on the Human Environment' has not been connected with a concrete implementation program to solve environmental pollution on a global scale.

Since 1972, a number of environmental accidents have happened throughout the world which threatens mankind's health, safety, and the entire eco-system. Examples of such accidents include air contamination by SO_x (eg, London Smog, Donora etc.), soil contamination and health problems caused by DDT, PCBs, and dioxins in the 1960s and 1970s, Itai-itai disease by cadmium and the related human Minamata disease by mercury in Japan in 1968, acid rain in the 1970s, 80's and to the present in many regions of the world. Furthermore, both the Love Canal contamination that was documented in 1978 and the Bhopal explosion that released methyl iso-cyanate (MIC) in 1984 that killed thousands, awakening more and more people to the risks of industrial production processes that are not properly managed.

Additionally, transportation related accidents such as the extensive contamination of the Gulf of Alaska that was caused when Exxon Valdez' ship ran aground in 1989, or the Phenol leakage in the Nakdong River in 1991, or the Sea Prince crude oil Spill in Korea' South Sea in 1995 showed that frequently human error and technological failure frequently contribute to severe short and long term ecological and human risks.

These not only caused great ecological and human impacts, but they also caused an overall decrease in trust and confidence among the general population in the "Better Life through Chemistry" slogan of one chemical company

Table 1.1 Key Environmental Accidents around the world

Key Accidents	Year	Core Substances	Impacts on companies
Chemical materials in pesticides, and related toxic substances such as heavy metal contamination.	1960s ~70s	·SOx, Dust etc. ·HBC, DDT, PCB, Dioxin ·Cd,Hg, Pb	·Founding of UNEP and Development and release of the Stockholm Declaration
Explosion in Bhopal	1984	·MICs	·Responsible Care Program in the Chemical Industry
Contamination in Gulf of Alaska by an Exxon Ship	1989	·Oil	·Valdez or CERES Principle ·Environmental Management in Corporations
Southern Sea Contamination in Korea by Oil Tanker Sea Prince[4]	1995	·Oil	·Proactive consideration of environmental issue in its decision-making process

[4] The oil tanker 'Sea Prince' spilled 5,035 ton of crude oil into the marine environment around Sori Island near Yosu(see Yim, U.H., Oh, J.R., Hong, S.H. 2002).

These series of accidents and the results of longer term releases of toxics to the eco- and human-sphere provided momentum for concentration by the world community on environmental issues within the UN and national governments. UNEP founded the World Commission on Environmental and Development (WCED) as a subordinate in 1984 and developed the commission to the Environmentally Sound and Sustainable Development (ESSD) in 1987, which was challenged to develop a new philosophy for 21 century that was then discussed at the 1992 Rio Summit

In addition, since the mid-1990s the problems of poverty in developing countries have expanded rapidly to developed countries like the United States and European nations and have become high priority in most of the world.

During this time, corporate social responsibility (CSR) has grown and is challenging companies to focus simultaneously upon their TBL as a way to seek to ensure their corporate sustainability.

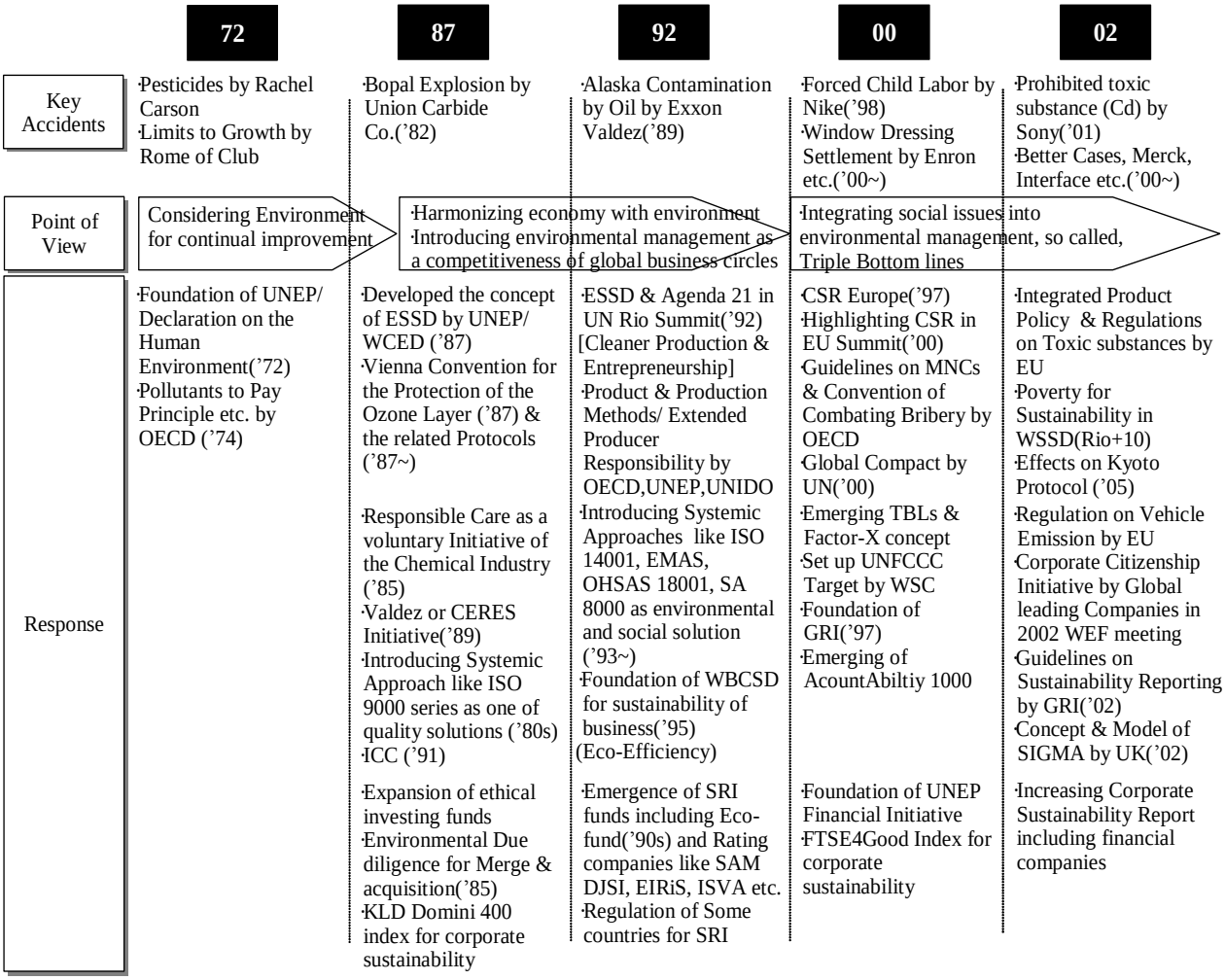
Due to the international political climate in 2000, the United Nations formulated the Global Compact as a set of international principles for anti-corruption, preservation of the environment, improvement of human rights and proper labor practices (1999). The World Summit on Sustainable Development (WSSD) meeting held at Johannesburg in 2002 adopted 'elimination of poverty' as a top priority issue which mankind should address.

Based upon these and other initiatives, sustainable development/sustainability, which was highlighted in 1987 by the Brundtland Commission, has a three-point focus comprised of the economy, environment and society. The same triple focus is also being used as the basis for corporate sustainability management.

Figure 1.1 highlights some key pressures facing CSM by years. Based on the figure, 1972, 1987, 1992, 2000, and 2002 were important years in the emergence of corporate sustainability perspectives. Figure 1.1 highlights some of the efforts of international organizations including UNEP, UNIDO, EU, OECD, industry institutes like the International Council of Chemical Association (ICCA), Organization D'nternationale des Constructeurs D'automobiles (OICA), World Semiconductor Council (WSC). Additionally, financial institutions who assesses the credit ratings of firms and executes mergers and acquisitions (M&A) related activities began to notice the TBL perspectives that enhance the corporate image and long-term performance of corporations.

Figure 1.1 suggests that as time has passed, human beings' concerns with regard to sustainability perspectives have been expanded from the environment to other social issues such as child labor, worker health and safety, and disease and poverty. Therefore, corporate leaders are increasingly challenged to incorporate a diversity of TBL focus as they seek to solve or to prevent many unsustainable practices. It is believed that such TBL efforts will help business become more responsible and will enhance the public's trust and confidence in them.

Figure 1.1 Key Pressures regarding Corporate Sustainability Management



1.1.2 New TBL criteria as significant elements for sustainable competitive advantage

Sustainability has been given a more concrete form for management strategies since 1992, especially with considerable growth of *Sustainable and Responsible Investment* (SRI)[5] based on the TBL during the last 10 years. The business climate in Europe and the USA has had especially great influence on global leading and multinational companies, which have integrated sustainability into their management strategies. In addition, recent events in the financial markets suggest that major changes had to be made to keep the industry more transparent, honest and trust worthy.

Accountability has risen to a prominent position on the corporate radar in the wake of the Enron and the many other similar scandals, worldwide. Major players in the financial markets like pension funds

[5] ASrIA and UKSIF defined, also known as *Socially Responsible Investment*, is investment which allows investors to take into account wider concerns, such as economic development including conventional financial considerations, a healthy environment, or social justice and peace.

and banks are looking more closely at their investment portfolios in regard to sustainability and well-governed companies. SRI-screened products and services are part of an emerging market with many actors, tools, metrics, products, and services. The leaders of these institutions believe that a careful consideration of environmental and social factors adds value to existing financial analysis[6]. They consider these issues when undertaking a systematic assessment on: overall impacts of processes, products, services, records regarding patent infringements or negative publicity, environmental and social innovation, motivations and management, etc.

This means that TBL pressures are having a great influence on sustainable competitive advantage of corporations through the financial market. The recent sharp growth of SRI funds in the world (see table 1.2) and the outstanding performance of several SRI indexes (see figure 1.2~1.5), compared with traditional financial indexes as their benchmark, provide crucial evidence that corporate use of the TBL approaches can help them improve their sustainable competitive advantage.

Table 1.2 Scales of Sustainable and Responsible Investing Funds

Countries		Scale	Remarks
USA		US$2,290 bn	· Total Net Asset, $ bn: 639(95), 1,185(97), 2,159(99), 2,323(01), 2,164(03), 2,290(05) · No. of fund: 168 in 1999 → 230 in 2001 · 43% tracked by Morningstar: received four or five star rating (General Mutual Fund: 32.5%).
	Europe	€1,033bn	· €336bn in 2003 → €1,033bn in 2005
	UK	£524bn	· £52bn in 1999 → £524 in 2005
	Germany	EUR5.3bn	· €1.5bn In 2000 → €5.3bn in 2005
Canada		US$1.23bn	· US$.1.31bn in 2000 → US$1.23bn in Dec. 2006
Australia		US$11.98bn	· US$325mil. In 2000 → US$ 11.98bn in 2006
Asia		US$0.6bn (only, Japan)	·Recently, rapid growth centering in Japan, Hong Kong etc. · Japan (11), Hong Kong (7), Singapore (4), Korea, Malaysia, India (2 for each country), Indonesia, Taiwan (1 for each country) etc.

Source: US, EU, Canada, Australia Social Investment Forum, 2006; SAM (2006)

Table 1.2 includes a detailed description of SRI funds centered on developed countries such as the USA, UK, Canada, Australia, Japan, etc. The sizes and numbers of the funds have increased

[6] The general environmental and social criteria of SRI investors are summarized as follows(Van Den Brink, 2002);

·Environmental criteria: climate change, water scarcity, water, air (including noise), soil pollution, toxic waste generation, biodiversity, resource depletion (e.g. tropical and old growth deforestation) and ecological footprint overload. Therefore, companies from an environmental perspective should demonstrate clear, uncompromising thinking about the environment as a core component of their corporate strategy; an improved eco-efficiency, increasing the material and energy use efficiency of their operations, and eco dimensions of new product design.

·Social criteria: profit sharing, welfare at work, equal opportunities and diversity, participation and rights, civil or employee actions, supplier motivation, community and public policy, corporate governance etc. Therefore, companies, from a social perspective, should demonstrate strong and willing involvement of the entire workforce in the development of the company, and equally show the ways this is achieved including their accountability to the wider world through appropriate corporate citizenship or social responsibility.

dramatically from 1999 to 2005.

Rapid growth of SRI in Europe and the USA is now being followed by SRI activity in Asia. Total money under SRI management in Asia is less than US$2.5bn, but it is likely to increase substantially. This suggests that sustainable economic development is the only viable option for sustainable development in Asia. SRI can be a key market mechanism for helping corporations and society make progress toward sustainability[7].

- In the US, over US$2,290 bil are invested in professionally managed portfolios utilizing one or more of the three strategies that together define socially responsible investing - screening, shareholder advocacy, and/or community investing (Social Investment Forum, 2006). The figure in 2005 is about 2.2 times compared with that in 1995. One out of every 8 dollars invested in the US is invested in SRI funds. Eleven of the fifteen screened funds (73 percent) with US$100 million or more in assets earned top marks for performance from either or both *Morningstar and Lipper ratings* for the one- and three-year periods ending September 30, 2001. According to Morningstar, 43 percent of the socially responsible mutual funds they track, earned either four or five stars, compared with 32.5 percent of all mutual funds. The number of social screening mutual funds has grown from 168 (1999) to 230 (2001).
- The SRI market In Europe has been sharply increased from €336bil in 2003 in terms of asset under SRI management to €1,033bil in 2005. UK and Germany make a great contribution to the rapid growth of SRI fund in EU; that is, the SRI worth in UK in 2005 market is increased 10 times compared with that in 1999, and 3.5 times compared with that in 2000. SAM (2006) argued that two countries including France, Sweden, Norway established regulation for pension funds integrating sustainability criteria
- In Canada, the SRI market is worth US$1.23 bil in terms of assets under SRI management, as of December 2006 (Social Investment Organization: www.socialinvestment.ca). In Australia, the SRI market was worth AUS$13.9 bil (US$ 9.1bil), as of September 2002 (*Ethical Investment Association benchmarking report: http://www.eia.org.au/*).
- Japan has the most developed SRI market in Asia, apart from Australia, which is now a full-fledged SRI market in its own right. Although the first SRI-related fund was launched in Japan less than three years ago, currently11 fund options for a total of almost US$1 bil are invested. There are six domestic eco-funds, two international eco-funds, one domestic SRI fund and two international SRI funds. The Daichi Life and Nikko Eco Funds were the first to be launched in 1999. The Nikko Fund was immensely popular in the retail community and far exceeded capital investment expectations. The popularity of the Nikko Eco-Fund spurred other fund providers to set up eco-funds and more recently Nikko has made a further pioneering move by establishing a Global Sustainability fund that takes into consideration of environmental and social factors (www.asria.org).

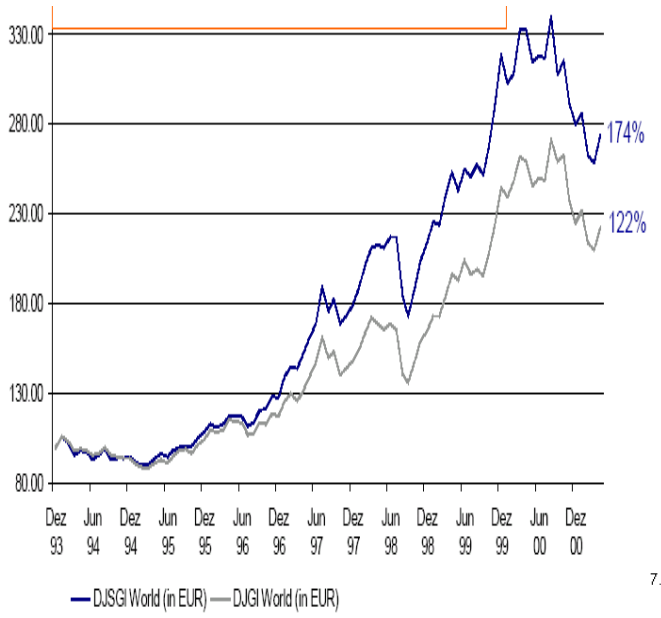
The countries in Asia including Hong Kong recently have expanded into more SRI fund options. There is still a chronic lack of Asian funds invested in Asia, but perhaps the recent launch of global SRI funds in Asia by some of the large international SRI players is an indication that fund managers are

[7] The notion of unfettered business expansion, at any cost, in Asia has been dealt a body blow by the crisis of 1997. The economic costs of the unnecessary destruction of natural resources and the fallout from large-scale industrial projects are now recognized as significant externalities which can wholly undermine the benefits of growth(ASriA, 2001)

starting to recognize the opportunity for SRI. Henderson Global investors' Horizon Global Sustainable Investments Fund (2001) and Friends Provident's Global Portfolio (July, 2001), Kingsway Fund Management's Mandatory Provident Fund scheme (2002, focusing on the local opportunity) in Hong Kong, Unifem and United Overseas Bank (UOB) Global Fund (1999) in Singapore, Eco Fund in Taiwan and thirteen Islamic funds based on Syariah finance principles in Malaysia launched SRI fund. ASriA (www.asria.org) argued that the rapid increase of SRI funds in Asia can be explained; an intangible influence of Global SRI funds regulated by each country's law, portfolio management techniques and more sophisticated research tools (such as the EIRiS, SAM etc.) have evolved since the late 1990s, and increased sustainable awareness by consumers.

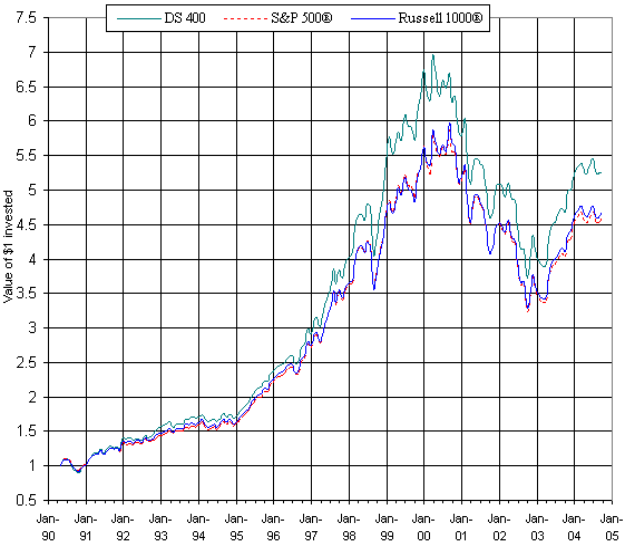
The next best thing for corporate competitiveness as a role of the TBL is the fact that the performance of SRI indices do not fall behind those of traditional financial indices. Both empirical and academic studies suggest that there is no systemic reason for SRI funds to under perform. Indeed much analysis confirms that SRI funds perform as well and often outperform the non-SRI funds. As with any other fund category, the state of the market will influence overall performance. A series of typical TBL indices like SAM DJSI, FTSE4Good, Domini Social 400, Ethibel Sustainability Index, FTSE4Good etc. have outperformed traditional financial indices such as the S&P 500, etc. (See Figure 1.2, 1.3, 1.4, and 1.5).

Figure 1.2 Comparability of the performance of DJSGI with DJGI, 1993 ~ 2003[8]



Source: www.sam-group.com

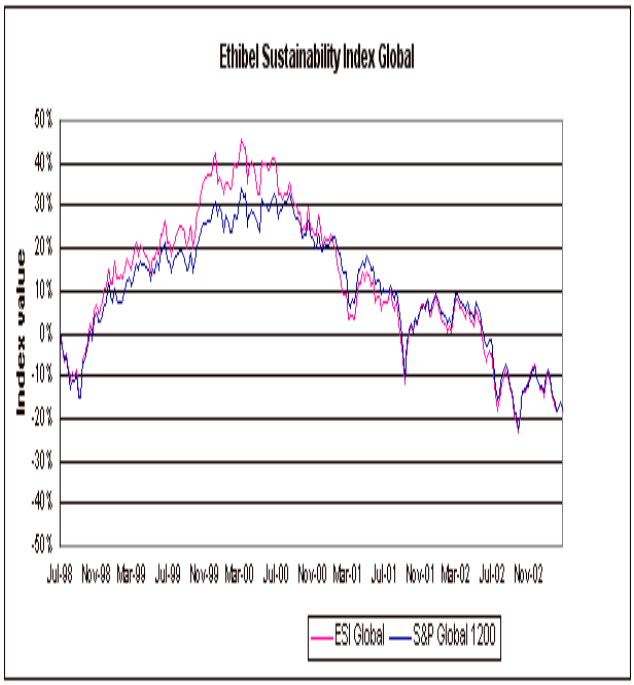
Figure 1.3 Comparability of KLD Domini 400 with S&P 500 over last 16 years[9]



[8] The *Dow Jones Sustainability Indices* (launched in 19
performance of the leading sustainability-driven compar
300 companies that represent the top 10% of the leading
countries covered by the biggest 2,500 companies in the

[9] The KLD Domini 400 Social[SM] Index (DS 400 Index), l
index of 400 common stocks screened according to bro
benchmark for measuring the impact of social screening

Figure 1.4 Comparability of ESI Global with S&P Global 1200 over last 5 years[10]



Source: www.ethibel.com

Figure 1.5 Comparability of FTSE4Good with FTSE 350 over last 5 years[11]

source:www.ftse.com

This outperformance of SRI funds had influence on accerlating SRI investments in the world. For example, since 1999, rating institutes such as Innovest Strategy on Value Advisor (ISVA) in USA and Kingsway in Hong Kong who evaluated and rated companies from TBL perspectives, and have presented their findings to the public. Even though those results did not have a big impact on corporate competitiveness and image until now, global leading companies have gradually expressed more interest in their issues.

Furthermore, performance of environmental due diligence has had a large influence on corporate value in the process of mergers and acquisitions (M&A). For example, when GE capital makes a deal for M&A, it must conduct due diligence in environmental perspectives into its manufacturing business. Environmental due diligence is a general phenomenon in USA, after the US EPA put the requirements into the Clean Air Act (Reclaim Program) in 1984. Some Korean companies, which have tried to sell their companies, have experienced hard negotiation challenges with the buyer because of environmental problems that were discovered in the process of due diligence during the 1990s. At that time, the buyer

[10]The Ethibel Sustainability Index(= a financial and a social profit**)** provides a comprehensive perspective on the financial performance of the world's leading companies in terms of sustainability for institutional investors, asset managers, banks and retail investors (www.ethibel.com).

[11]FTSE4Good is an index series for socially responsible investment designed by FTSE, one of the world's leading global index providers. There are four benchmark and four tradable indices facilitating investment in companies with good records of corporate social responsibility(www.FTSE.com)

demanded that the market price of the company should be lower than the original price suggested by sellers, or sellers should be responsible for some periods after the trade, due to the fact that they had used toxic substances and un-anticipated problems may surface after the purchase.

1.1.3 Global market rule in business circles

The core reason that non-financial issues including corporate governance, environmental contamination, and social issues are more crucial in business circles now is due to the fact that a variety of guidelines have been enacted by international organizations like the UNEP, UNIDO, EU, OECD, ISO etc. These principles and guidelines have had a great impact on the regulations of countries, particularly in equalizing the level of regulations. In accordance with these principles and guidelines, business activities of global leading companies and multinational companies should apply the same criteria in all countries in which they have production facilities.

Typical types of principles are the Product & Process Methods (PPMs) and Extended Producer Responsibility (EPR)[12] from the OECD and Integrated Product Policy (IPP) of the EU. Typical types of international guidelines or standards are the ISO 9000series, ISO 14000series, OHSAS 18000, SA 8000, guidelines on the GRI Sustainability Reporting, and the AA 1000. The Multinational Environmental Agreements (MEAs) have also played a role in establishing new market rules. The Vienna Convention for the Protection of the Ozone Layer, the United Nations Framework Convention on Climate Change, and the Stockholm Convention on Persistent Organic Pollutants are global treaties designed to help society to protect human health and the environment from harmful chemical and toxic substances, and greenhouse gases.

In addition, the United Nations endorsed the Global Compact[13] as one of several Corporate Citizenship Initiatives for encouraging voluntary efforts of business circles in the late 1990s. The EU began emphasizing corporate social responsibility (CSR) in 1995, and the EU Summit of 2000[14] strongly highlighted the need of CSR. OECD and the USA enacted "Guidelines on the Convention on Combating Bribery of Foreign Public Officials in International Business Transactions" and "Sarbanes-Oxley Act"[15] respectively, for social responsibility[16] of a corporations or business.

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[12]Encourage the practice of shared responsibility for the environmental impact of products among the designers, suppliers, manufacturers, distributors, users, and disposers of those products.

[13]A network of more than 1,000 international businesses, labor and civil society organizations that work to make universal principles of human rights, labor and the environment part of an organization's operations and culture. UN Secretary-General Kofi Annan was endorsed in the late of 1990s.

[14]EU Commission a group of business leaders joined by former President Jacques Delors to sign the European Business Declaration against Social Exclusion(1995); EU Corporate Social Responsibility Forum(1996); EU Summit, highlight of the need for CSR (2000); European Business Campaign on CSR from 2000; Commission of the European Communities, Green Paper: Promoting a European framework for Corporate Social Responsibility(2001); Commission of the European Communities, Foundation of European Muti Stakeholder Forum on CSR(2002) and Conference(2004);

[15]The following is to put window dressing settlement and sanction cases uncovered by USA SEC in 2002 in order.

The main purpose of these principles and guidelines is to extend and intensify producer responsibility on environmental and social responsibility perspectives. The WSSD meeting held in 2002[17] suggested "sustainable consumption and production" as a direction of producer responsibility in business circles. The direction of international law and regulation at four points of view (pollution prevention, total emission, market incentive, voluntary initiative) has influenced sustainable production and consumption in business circles. The trend at four points of view is as follows; the managing viewpoints, perspectives, or range of non-financial issue has been shifted from the "end of pipe" to "pollution prevention" based

Name of Company	Recently, SEC Sanctions
Tyco	No notice of the fact that the former CEO looted more the US$600mil from the firm via improper bonus, loans, and stock sales
Time Warner	Accuse Time Warner of improperly booking more than US$400mil in advertising revenues
WorldCom	The improper booking; the total amount of fraudulent accounting may exceed US$9 bil (Not considering allowance for bad debts).
Microsoft	Violating booking rules for holding millions of dollars in reserve (about US$200~900mil.) between 1995 and 1998.
Xerox	Violating generally accepted accounting principles (GAAP), accelerating the company's recognition of equipment revenue by over US$3bil. And Increasing its pre-tax earnings by approximately US$1.5bil between 1997 and 2000; As a result, paying an unprecedented US$10mil penalty.
ACLN	Temporarily suspended trading in the securities of Concentrax because of questions that have been raised about the accuracy and adequacy of assertions in press release by Concentrax
PWC/KPMG LLP/Ernst & Young	Violating an Accounting Firm's duty to remain independent from companies it audit

Source: www.yahoo.com including daily newspapers

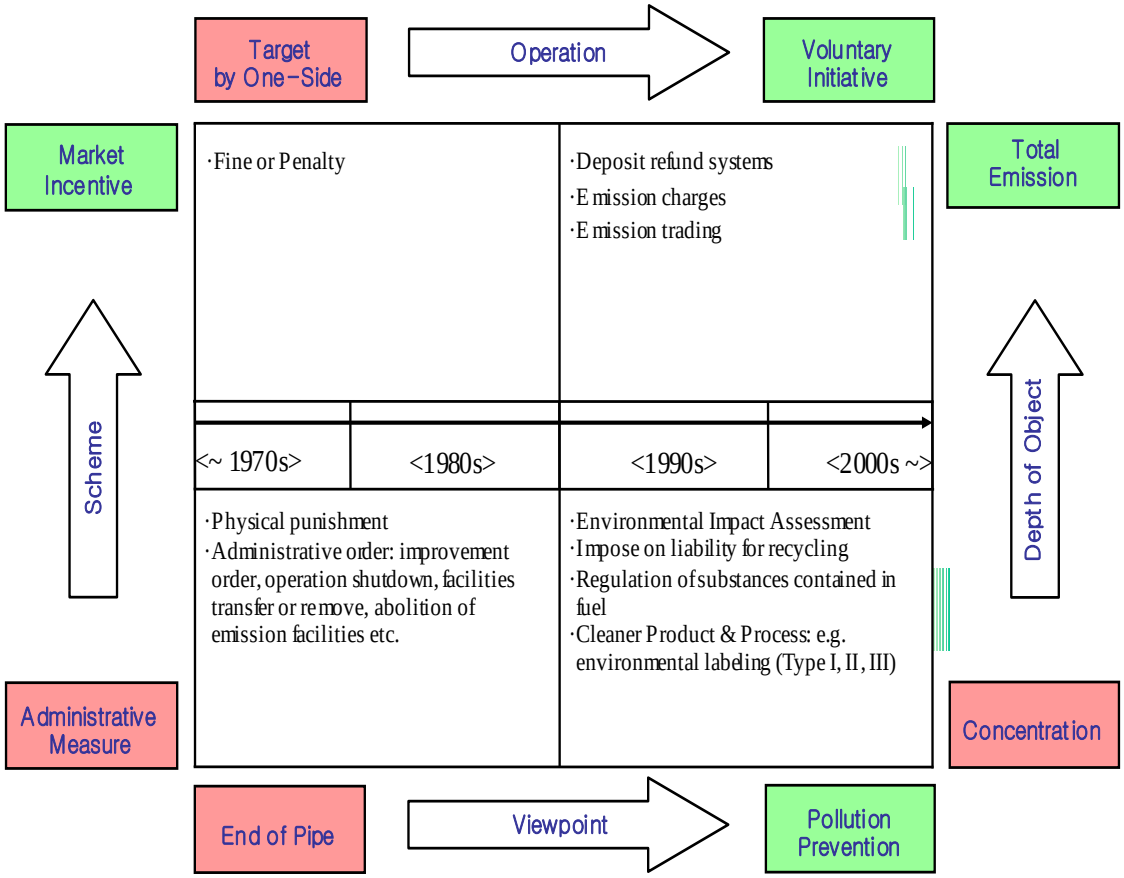
[16]'Responsibility' is the obligation to act whereas 'accountability' is the obligation to answer for an action. In general, 'responsibility' implies 'accountability'. In case of corporate responsibility and corporate accountability, they are very often used interchangeably. When a corporation acts "responsibly," it meant the company is conducting its business activities in a reliable, trustworthy, credible manner. "Accountability," however, means corporations must adhere to regulatory or legal requirements or otherwise be held liable or face sanctions. The fundamental difference between the two concepts is corporate "accountability" requires independent oversight and enforcement mechanisms to ensure compliance, whereas corporate "responsibility" relies on voluntary self-regulation. In response to increasing public demand for corporate accountability, business has championed a plethora of voluntary "corporate responsibility" initiatives. Yet the dozens of regional, national and industry-sponsored voluntary initiatives have failed to deliver responsible corporate behavior for several reasons:

- They are very often phrased in general, inspirational terms and therefore, lack specific requirement s or responsibilities;
- They do not require public disclosure of social and environmental impacts;
- They rely on self-regulation, meaning there is no enforcement or independent verification to ensure the company is adhering to its code of conduct;
- They fail to empower citizens and stakeholders. Companies cannot be held liable if they fail to conduct their activities in accordance to their codes of conducts; and
- They simply do not provide strong enough incentives for compliance to counterbalance the financial incentives for non-compliance.
- A corporate accountability framework would establish disclosure requirements on social and environmental impacts, so governments and the public can actually know whether corporations are conduction their activities in a responsible manner – something that voluntary initiatives fail to deliver (By Friends of the Earth).

[17]Extended Producer Responsibility (EPR) regarding Package wastes and resource recycling, Guideline on scraped car of EU (ELV, approval in case of over 95% of recycling rates of new car in 2007), recycling system of scraped household electric appliance in Japan are typical cases(EU, 2004).

on the whole life cycle thinking through the process and product. The scheme structure has been shifted from "administrative measure" basis to "market incentives" basis. The operation or enforcement approach of the scheme has been shifted from "target by one-side" basis, enforced primarily by the regulator/government, to "voluntary initiative" basis with the full participation of the key stakeholders. And, finally, the depth of object or material (e.g. environmental pollutant) has been shifted from "concentration" to "total amount emitted" (See Figure 1.6).

Figure 1.6 Trends of global market rule in sustainable production and consumption



The below explains in detail trends of global market rule in sustainable production and consumption in four points of view;

- Whole life cycle thinking as a solution: The Life Cycle Initiative is a response to the call from governments for a life cycle economy in the Malmö Declaration (2000)[18]. It contributes to the 10-

[18]Being opened at Ministers of Environment and heads of delegation meeting in Malmö, Sweden from 29 to 31 May 2000, on the occasion of the first Global Ministerial Environment Forum, held in pursuance of United Nations General Assembly resolution 53/242 of 28 July 1999 to enable the world's environmental ministers to gather to review important and emerging environmental issues and to chart the course for the future: *Recalling* (1) the Stockholm Declaration of the United Nations Conference on the Human Environment, (2) the Rio Declaration of the United Nations Conference on Environment and Development, (3) the Declaration of Barbados on the Sustainable Development of Small Island Developing States as well as (4) the Nairobi

year framework of programs to promote sustainable consumption and production patterns, as requested at the World Summit on Sustainable Development (WSSD) in Johannesburg (2002)[19]. The concept of Whole Life Cycle Thinking integrates existing consumption and production strategies, preventing a piece-meal approach. Life cycle approaches avoid problem shifting from one life cycle stage to another, from one geographic area to another and from one environmental medium to another. Human needs should be met by providing functions of products and services, such as food, shelter and mobility, through optimized consumption and production systems that are contained within the capacity of the ecosystem. Cleaner Production (CP) is the international term for "sustainable business" reflecting whole life cycle thinking, reducing environmental impacts from processes, products and services by using better management strategies, methods and tools. And for non-tariff barriers issues for environmental soundness on the basis of environmental labeling etc. which is central to life cycle approaches in business cycles (UNEP Industry and Environment, 1989; www.WBCSD.org).

- The rise of Market mechanism[20] based on economic incentive tools such as deposit systems, emission charges[21], marketable permits or emission trading[22]: Market incentives, such as tradable permits and environmental fees, should be used to achieve environmental goals and stimulate technological innovation. Market-based approaches should be appropriately designed for specific problems to ensure that the most effective and fair solutions are achieved in a least-costly manner.
- Regulations based on total emissions were rapidly expanded: Environmental regulations of most

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Declaration on the Role and Mandate of the United Nations Environment Programme.

[19]The WSSD plan of implementation states: *"We must develop production and consumption policies to improve the products and services provided, while reducing environmental and health impacts, using, where appropriate, science-based approaches, such as life cycle analysis"*(WSSD, 2002).

[20]The conceptual foundation for market mechanism in pollution control had been sketched out in the largely hypothetical speculations of economists for decades before the passage of the CAA. Indeed, as early as 1862 John Stuart Mill noted that "if from any revolution in nature the atmosphere became too scanty for the consumption, air might acquire a very high market value." Pigou had developed an elaborate argument for using pollution taxes to equilibrate "private" and "social" costs by the 1920's. The modern era in resource economics as applied to "fugitive" resources like air arguably began with an elegant 1954 analysis by H.S. Gordon of fisheries as common property resources. That was initially followed by a small number of comments and minor studies, and then in the early 1960s by R. H. Coase's extremely influential article in which he argued that private bargaining will eliminate externalities in a far larger class of cases than commonly believed, and that governmental intervention is therefore, much less often justified than commonly believed. Significant battle lines had thus, been drawn in the general terrain of the then-reigning welfare economics.

[21]*Emissions charges* would require polluters to pay a fixed price for every unit of pollution emitted. They would only pay those emission charges lower than the cost of pollution control; they would therefore, reduce emissions until the unit cost of further reductions exceeded the unit tax. And, of course, controls would be concentrated among polluters for whom reductions are most extensive, thus minimizing the total social cost of pollution control (Meidinger, Errol, 1985).

[22]*Marketable Permits* would seek the same end in a slightly different fashion. Instead of taxing all emissions, they would require all emissions to be covered by permits. Only a limited number of permits would be available. Therefore, those polluters for whom emissions controls are most expensive would buy up the permits while those for whom controls are least expensive would reduce emissions (Meidinger, Errol, 1985).

countries, particularly in developed countries, are currently based on total emission which industries produce during production of their products. As the physical environment came to be widely perceived as a serious and growing problem in the last half of the decade, the relative desirability of regulations based on total emission such as emissions charges, marketable permits, private bargaining are needed more for sustainability, when compare to traditional regulation for handling pollution problems. In particular, by the end of the decade, the market mechanism was more elaborated, and not surprisingly, emerged as the most alternative approach in most of countries.

- Voluntary initiatives[23]: The ideal voluntary initiatives are clearly stated and have publicly supported goals, targets, and timelines. Progress is measured and reported at regular intervals, with problems addressed openly and expeditiously. The initiative is evaluated and adjusted, and if necessary, with the full participation of stakeholders. Independent verification of results demonstrates that the goals and targets are being achieved in a cost effective way, and the company or sector is publicly recognized for exemplary environmental performance. The process and results of the voluntary initiative are shared with other companies and sectors, which in turn serves to stimulate similar approaches and initiatives (Pollution Probe 1999: 63).
  - Offer more flexibility and leadership to greater innovation and enhanced performance
  - More cost-effective than regulations
  - Employ positive motivators such as self-initiative and pride rather than negative motivators such as regulatory coercion
  - May provide a defense of due diligence when environmental problems occur, thus reducing legal liability
  - Deal better with multi-jurisdictional issues (ie. Easier to get federal- provincial and international cooperation)
  - Better suited to rapidly changing technologies and to pollution prevention strategies
  - More environmentally conscious consumers are creating demand for cleaner products and cleaner production processes, thus increasing industry interest in such things as voluntary eco-labeling

The rapid emergence of the sustainability concept in strategic management had a great influence on motivation for this dissertation. That is to say, these trends have become the core ground for sustainability management.

1.2 Motivation of the research for this dissertation

The concept of sustainability has become a global concern in the late 20th century and is currently more crucial in strategic management as a new paradigm of business circles. Even though the importance of sustainability has been recognized from the practitioner's literature, much remains to be

[23] It is a contract between the public administration and the industry in which the firm agrees to achieve a certain environmental objective, and receives a subsidy to change its technology through R&D and innovation. The agreement is bilateral, between one firm and the administration, and requires a voluntary element on both sides (Pollution Probe 1999: 63).

explained as to why, how, and what considerations companies integrate into their strategic frameworks. Since the end of 1990s, global leading companies such as Shell, Philips, BASF, BHP Biliton, Arcelor, Alcan, and Toyota have set up new management philosophies to integrate sustainability for coping with these new kinds of business circumstances. However, the strategic framework of some companies for corporate sustainability has not become clear until recently, and it is hard to detect the connection between their strategies and their strategic actions. In light of these facts, the strategic framework of global leading companies for sustainability has been evolving for achieving sustainable development.

Although Korea has some globally leading companies that started to consider sustainability, most companies in Korean business circles do not integrate sustainability concepts in the course of their decision-making, compared with other global leading companies. The management framework of some companies, which insist on taking sustainability into account, is ambiguous, consequently an observer cannot adequately grasp the essence of their sustainability management.

Based upon a wide array of documentary records and interviews with Korean business people, the following are the reasons that corporate sustainability management remains in the initial phase in Korean business circles:

- Even though Korea is one of the leading developing countries, most CEOs and boards of directors have their focal point mainly on financial performance. They have thought that environmental contaminants produced during manufacturing should be managed with minimal cost when pollutant reduction is needed. In such cases, Korean companies do not consider environmental and social issues in their strategic management perspectives under any scenario.
- The enterprise culture in Korean business circles does not introduce or integrate sustainability in its business activities. In particular, Korea is a traditionally patriarchal society. This means that power is centralized in management, especially under the CEO. Therefore, the business style of most Korean companies is not accustomed to considering social issues like human rights, labor relationships, etc.
- Korean company leaders do not understand sustainability and corporate sustainability concepts fully. They believe that sustainability, considering its definition according to the report of the United Nations' World Commission on Environment and Development, *Our Common Future*, "that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (WCED, 1987:43), is not relevant for their practice. Because it is often merged with the concept of ‘environmental soundness’, Korean business leaders view sustainability as a superficial attempt to address environmental advocacy. In addition, although corporate citizenship, corporate or business social responsibility, and TBL concepts have been used for corporate sustainability management since the late 1990s, these terms have created confusion in Korean business circles with regard to exactly what corporate sustainability management is. Because they have such a superficial

understanding, most Korean companies have utilized CSM only as a public relations tool.

Furthermore, the degree of concern regarding sustainability issues in Korean management academic circles has been insufficient compared with the need of business circles. Although some intellectuals have studied sustainability since the Rio summit in 1992, their research has been primarily focused on the environmental aspects of sustainability. Most academic papers regard technical tools such as environmental management systems, environmental management accounting including performance indicators, and supply chain environmental management. It is difficult to find research papers and dissertations that explore sustainability from a strategic management point of view. However, Dr. B.W. Lee did study this topic for his dissertation in 1995, and he published several research papers regarding Korean companies like POSCO (1996), POSEC (1998), KOWACO (2001), and LG electronics (2004). Hyundai Motors (2002) and Samsung SDI (2003) have also prepared environmental strategies with help from a consulting firm.

Nevertheless, in Western countries, mainly Europe, many studies regarding environmental management strategies have been done since 1992. Initially, the research was oriented towards the relationship between corporate strategy and environmental issues so that environmental issues should be taken into account as corporate strategy. “Integrating the natural environment into the strategic planning process: An empirical assessment (Douglas, Thomas J, Judge, William Q Jr., 1995)”, “Manufacturing strategy and environmental consciousness (Sarkis, Joseph, 1995)”, “Evaluation of corporate environmental management approaches: A framework and application (Vastag, Gyula, Kerekes, Sandor, Rondineelli, Meadows, Dennis A., 1996), and “Corporate strategy and the environment (Jose, P D., 1996)” have tried to explore the fact that the environment is playing a larger role in corporate and manufacturing strategies.

Furthermore, since 1997, some research has been done to explore environmental factors affecting corporate strategy such as tougher regulatory forces, increasing public environmental concerns, and corporate responses for coping with these factors. Some research has been designed to make a model for environmental management. “World-class strategies for safety: a Boeing approach (Ansari, A., Modarress, Batoul, 1997), “Corporate strategies and environmental regulation: An organizing framework (Alan M Rugman, Alain Verbeke, 1998)”, “Corporate environmentalism (Subhabrara Bobby Banerjee, 1998), “Six cases of corporate strategic responses to environmental regulation (Alan M Rugman, Alain Verbeke) are papers focused on the environmental factors for corporate environmental strategy. An increasingly large number of organizations have been working to integrate environmental issues into their corporate strategies, making this type of research both possible and valuable.

In addition, corporate environmentalism is becoming a second nature for corporate strategy in business circles. Since 2000, a strategic model for competitive edge, a strategic framework to expand environmental management strategy into other organization, and an emerging corporate strategic

framework for global strategy have been studied. “A network approach to strategy (Juttner, Uta, Schlange, Lutz E, 1996), “Strategic marketing models for a dynamic competitive environment (Igal Karin, Kenneth Preiss, 2002), “Theoretical perspectives on strategic environment management (Don Goldstein, 2002), “Competitive edge: A strategic management model (T Russell Crook, David J Ketchen Jr, Charles C Snow, 2003), “An emerging framework for global strategy (John R Grandzol, Christian J Grandzol, Shan T Rippey, 2005), and “Integrating environmental management and supply chain strategies (Robert Handfield, Robert Sroufe, Steven Walton (2005)” are some of the leading articles in this area.

Finally, in 2000, transparency and social issues emerged together with environmental issues in corporate management. Since then research regarding corporate sustainability has been one of the general trends in the field of corporate strategy. The focus of research is mainly devoted to re-analysis or re-emphasis upon sustainable development (Virgilio M. Panapanaan, Lassi Linnannen, Minna-Maari Karvone, and Vinh Tho Phan, 2003; Marco Keiner, 2004), concepts and definitions of Corporate Social Responsibility, Corporate Sustainability, the TBL (Van Marrewijk, Marcel, 2005) are ways of integrating sustainability issues within corporate strategies (Anja Schaefer, 2003), and corporate sustainability frameworks (Teun Hardjono, Peter de Klein, 2004;Oliver Salzmann, Alleen Ionescu-Somers, Ulrich Steger, 2005).

To conclude, the ambiguous strategic framework for corporate sustainability management in Korean business circles, and the lack of relevant academic research in Korean academic society have provided the momentum for this dissertation author to choose this research topic.

This dissertation was designed to examine strategic corporate sustainability management in Korean business circles. It focuses on the concept and definition of corporate sustainability, core factors for sustainability in Korean business circles, the linkage between successful business practices with successful environmental and social practices, and enhancing corporate sustainability through empirical analysis of the Korean business market.

1.3 Objectives and Scope of the Research

The purpose of this dissertation is to explore determinants and directions for corporate sustainability management, particularly in Korean business circles. The appeal for social or societal behavior and the need for sustainability is not hype or a fashion that will pass without leaving any marks. Stated positively, it can be seen as a logical outcome of a development that has bought many people prosperity (Teun Hardjono, Peter de Klein, 2004). It means that all corporations in the world should incorporate sustainability issues into their core strategies for helping them to make real progress towards sustainable societies. As anticipated in the previous section, TBL issues are receiving increasing attention as organizations attempt to implement new management paradigms that enhance organizational value more

effectively. In reality, an increasingly large number of organizations, particularly, global leading or multinational companies, are attempting to integrate TBL issues within their corporate strategies. Furthermore, research regarding corporate strategy and sustainability issues has made steady progress since 2000 in many parts of the world, with the exception of Asian countries including Korea.

This dissertation author maintains that even though sustainability issues are very important in business circles from a corporate strategy perspective, core factors should also be identified for taking the business environment into account, particularly focusing on the relationship between traditional business factors and environmental and social factors for strategic corporate sustainability management. Therefore, the empirical studies of this dissertation rely upon and contribute to the linkage among business factors and environmental and social factors in three Korean companies.

Three research questions are addressed in the dissertation. Firstly, this dissertation author seeks to define the concept of corporate sustainability management on the basis of the concept of sustainability, the purpose of corporation, and business or corporate strategy. The author analyzed the evaluation criteria of key rating institutes such as KLD, SAM, EIRiS, ISVA, SNS Asset Management etc. including GRI sustainability reporting guidelines. The objective was to explore the core factors for corporate sustainability, to set up the framework of strategic corporate sustainability management, and finally, to make a corporate sustainability value model in order to integrate the TBL and corporate sustainability within the decision-making of corporate management. Anecdotal evidence shows that companies in developed countries, particularly multinational companies, have significantly endeavored to incorporate TBL issues into their decision-making processes (Oliver Dudok van Heel, John Elkington, Shelly Fennell, Franceska van Dijk, 2001).

This researcher developed a conceptual corporate sustainability value model that addresses key factors and the framework of corporate sustainability management in strategic perspectives. The model was applied to Korean companies in order to analyze the linkage between variables of business factors with variables of environmental and social factors.

The first research question and its related objective are:

***RQ1*: What factors[24] are generally considered for strategic corporate sustainability (in Korean business circles)?**

***OBJ 1*: To provide insight into definitions and concepts, identification of core factors, and a strategic framework for corporate sustainability management. In addition, to provide insight about a conceptual matrix to evaluate or test the relationships between the business factors and environmental and social factors, and to measure corporate values from a sustainability perspective.**

[24] one of the things that affects an essential element, part, or prerequisite for corporate sustainability management

Secondly, this researcher explored the direction of strategy in corporate sustainability management. In the last ten years, the notion of a 'business case' for corporate sustainability has increasingly been used by the corporate sector, environmental organizations, and consultancies and so on, to seek justification for sustainability strategies within organizations (Oliver Samzmann, Aileen Ionescu-Somers, Ulrich Steger, 2004). An exploratory study about building and finding a business case for sustainability has been carried out since 1994 (IISD, 1994; Weiser and Zadek, 2000; SustainAbility, 2001, 2002; WWK-UK, 2001). It can be posited that the strategy of corporate sustainability management is essential to help companies make real progress towards sustainable growth, provided that they endeavor seriously to reflect their culture, attributes of their industry, business atmosphere etc. in their strategy.

The Second Research Question and its related objective are:

***RQ2*: Is the direction of corporate sustainability strategy in Korean companies appropriate for sustainable growth of the companies?**

***OBJ 2*: To provide relevant empirical evidence for making the judgment about whether the direction of their sustainability strategy considering external opportunities and threats is right or not for the company.**

Thirdly, the author analyzed whether CSM is helpful to enhance corporate value in sustainability perspectives. Most of the authors of the relevant literature have tried to measure and clarify the relationships between environmental/social performance and financial performance (Preston and O'Bannon, 1997; McWilliams and Siegel, 2001; Waddock and Graves, 1997a, b), the frameworks differ in terms of the hypothesized causal sequence and the direction of the relationship (Oliver Salzmann, Aileen Ionescu-Somers, Ulrich Steger, 2004). But, rather than the relationships between these two factors, this research explores the degree of strength among three factors on the basis of collection of evidence and broad recommendations for action, based on supply and demand theory. This researcher attempts to accomplish the first two research questions and provide a richer understanding of adoption and implementation of strategic corporate sustainability management.

The Third Research Question and its related objective are:

***RQ3*: Why have Korean companies tried to integrate sustainability into corporate strategy?**

***OBJ3*: To provide relevant empirical evidence for the validity that corporate sustainability management is significantly helpful to enhance corporate value in sustainability perspectives.**

1.4 Outline of the dissertation

In Chapter 1, the background, the motivation, and research questions and objectives of this dissertation are discussed. An overview of the thesis is provided in Figure 1.7.

Chapter 2, presents the theoretical perspectives and methodologies of the research including a generic

overview regarding the research methodologies (B.W. Lee, 1995). The economic and business management theories for Corporate Sustainability Management are discussed in section 2.2. A conceptual model is developed and presented that builds upon prior studies on strategic sustainability management.

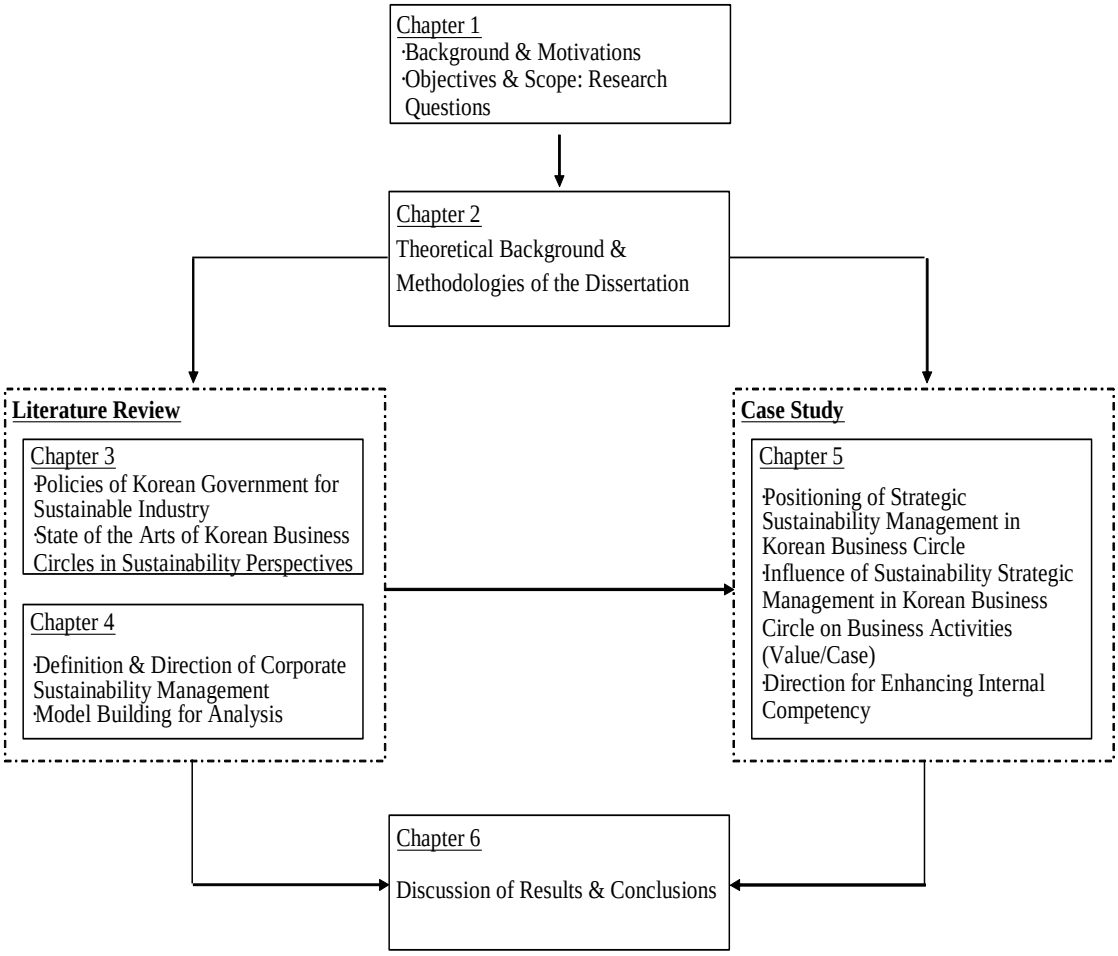
Chapter 3, illustrates the state of strategic sustainability management in Korean business circles and global leading companies in Plan-Do-Check-Act (PDCA) perspectives. Korean companies in the electronic, steel, and automobile industries, which are the leaders of strategic sustainability management in Korea, are the focus of this study. In the case of globally leading companies, companies in the electronic, steel and automobile industries were selected for comparison with their Korean counterparts with regard to their sustainability strategies, approaches and results.

Chapter 4, provides an organized overview about empirical studies that examine the concepts, determinants and frameworks of corporate sustainability from a variety of disciplines in which "sustainability" has been studied. In particular, the definition of corporate sustainability management is presented from an in-depth literature review presented. It is important to point out that specific research agendas have been pursued in this area to better position this dissertation according to the literature. Based on this review, this author emphasizes that further research on sustainability management in strategy perspectives is currently needed, particularly in Korean academia. The author focuses on the relationship between business factors and non-financial factors like economic, environmental and social issues as objects of research in this dissertation.

Chapter 5, presents the results of empirical research performed by in-depth interviews, participant observations, document analyses, and questionnaires. It targets electronics, steel, and automobile companies in Korean business circles that have recently been driven to introduce and integrate sustainability into their corporate strategies. The empirical research focuses on strategic positioning and direction in sustainability perspectives, and upon the influence of strategic sustainability management on the value of Korean companies based on the conceptual model (see figure 4.6).

In chapter 6, the author draws conclusions by referring to the results and findings confirmed through the literature and empirical studies. The limitations of the study are summarized and directions for future research about strategic corporate sustainability management are suggested.

Figure 1.7 Outline of the dissertation



CHAPTER 2. THEORETICAL PERSPECTIVES & RESEARCH METHODOLOGY

2.1 Introduction

Sustainable competitive advantage for firms has become a major research area in the field of strategic management (Porter, 1996; Barney, 1991). Many companies are adopting such approach as a new management paradigm. In this respect, the theoretical background for corporate sustainability management should be clearly understood.

In this chapter the author of this dissertation examines the theoretical background for CSM in economic and business management perspectives. The theory of internalization of externalities is examined as a driver for CSM from economic perspectives. The industrial organizational model and resource based model are mainly examined from the business management perspective. On the basis of the analysis, the author presents a theoretical background for CSM. The author also presents, in this chapter, three general research approaches used in this dissertation: a) exploratory study; b) descriptive study; c) casual testing or explanatory (Yin 2003, 1994).

2.2 Theoretical Background for achieving sustainable competitive advantages[25]

CSM has recently emerged as a new management paradigm to strive to fulfill profit maximization on both the long-term and the short-term basis to help the corporation attain continuous growth based upon the TBL. External effects (e.g. environmental pollutants), monopoly and oligopoly, shortage of public goods, and a lax moral fiber (e.g. human rights, relationships with communities) are examples of externalities in economic perspectives (Mihai Roman and Monica Roman, 2000). In the field of economics, TBL factors are often considered to be social costs which the main economic bodies, particularly business circles in a strategic management context, should take into consideration in order to attain social well-being that minimizes resource distortion. Typical theories for internalization of externalities in the field of economics are *the Coase theorem*[26] and *the Piguvian tax*[27].

These theories are based on key polices of governments and international organizations and they

[25] According to Barney (1991), a firm is said to have a *competitive advantage* when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors. A firm is said to have a *sustained competitive advantage* when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors *and* when these other firms are unable to duplicate the benefits of this strategy.

[26] Informally the Coase Theorem states that in presence of complete competitive markets and the absence of transactions costs, an efficient set of inputs to the production and outputs from production will be chosen by agents regardless of how property rights over the inputs were assigned to the agents. Bargaining, Mergers, Social convention and education are typical tools for the negative external effects to obtain an efficient outcome(http://economics.about.com, Mihai Roman and Monica Roman, 2000)

[27] A Piguvian tax is a public authority intervention for the internalization of externalities. Environmental regulation, taxes on pollution, and creating a pollutant market are examples of Piguvian taxes.

suggest that business circles can modify or improve their technology, enhance their productivity and reduce externalities like pollutant emissions. Business circles, ultimately, maximize their long term profits (Mihai Roman and Monica Roman, 2000). Therefore, this dissertation strives to explain theories for CSM that can be based on long term profit through the internalization of externalities.

As a result, the industrial organizational model (Porter, 1980, 1985) and the resource based model (Barney, 1991; Wernerfelt, 1984; Andrews, 1971) have embodied strategies for achieving sustainable competitive advantages in business management perspectives. In particular, the plan-do-check-act theory (Walter Shewhart, 1930s; W. Edwards Deming, 1970s) is one such crucial approach to enhance inner competency in the dissertation. Based on two perspectives of the firm (Porter, 1980, 1985, Barney, 1991; Wernerfelt, 1984), several authors have identified environmental, social, as well as ethical resources and capabilities that can be a source of sustainable competitive advantage. Garriga and Melé (2004) call these theories 'instrumental theories' in business management perspectives. This dissertation examines briefly, the philosophy of proper theories for CSM, that is to say, for achieving sustainable competitive advantage.

Recent, theories that consider the economic consequences of interactions among business, social and environmental improvement activities are very versatile. Garriga and Melé (2004) classify them into four types: the first one addresses instrumental theories in which the corporation is an instrument for wealth creation, the second pertains to the social power of corporation theory which emphasizes its relationships with society, the third refers to theories which consider that business ought to integrate social demands, and the fourth includes theories asserting that relationships between business and society are embedded within the ethical code.

Among these theories, the instrumental theories assume that the corporation is an instrument for wealth creation. Therefore, any supposed economic, environmental, and social activities are accepted if, and only if, they are consistent with corporate profits or wealth creation. Considering that CSM is seen as a strategic tool to achieve economic objectives and, ultimately, wealth creation, the instrumental theory classification is particularly relevant for looking at CSM (See chapter 4 for more details).

Instrumental theories have a long tradition and have enjoyed wide acceptance in business, particularly in the field of corporate social responsibility as strategic management. As Windsor (2001) pointed out recently, "a leitmotiv of wealth creation progressively dominates the managerial conception of responsibility" (Windsor, 2001, p.226). However, concern for profits does not exclude taking into account the interests of all who have a stake in the firm (stakeholders). It has been argued that in certain conditions the satisfaction of these interests can contribute to maximizing the shareholder value (Mitchell et al., 1997; Odgen and Watson, 1999). An adequate level of investment in philanthropy and social activities is also acceptable for profits (McWilliams and Siegel, 2001). In this respect,

'stakeholder management[28]' should be considered for the maximization of profits. This dissertation addresses this point in Chapter 4.

Two major approaches have been discussed for understanding sources of sustainable competitive advantage for the firm in the field of strategic management.

One research area has focused on isolating a firm's opportunities and threats, describing its strengths and weaknesses, or analyzing how these are matched to choose strategies as sources of sustained competitive advantage (Porter, 1980, 1985; Hofer & Schendel, 1978). Generally, it is referred to as "The Industrial Organization (IO) Model." The IO model suggests that above-average returns for any firm for sustained competitive advantage will be largely determined by industry structure or attractiveness of the external (industry) environment rather than by the internal characteristics of the firm. The typical analysis is the 'Structure-Conduct-Performance' Model (Scherer and Porter, 1970s; Bain, 1950s~1960s; Mason 1930s~1940s), and the five forces framework (Porter, 1974, 1980). Porter and his colleagues (Caves & Porter, 1977; Porter 1980, 1985) have attempted to describe the environmental conditions that favor high levels of firm performance. Porter's (1980) "five forces model," for example, describes the attributes of an attractive industry and thus, suggests that opportunities will be greater, and threats less, in these kinds of industries. Much of this type of strategic research has placed little emphasis on the impact of idiosyncratic firm attributes on a firm's competitive position (Porter, 1990). Implicitly, this work has adopted two simplifying assumptions. First, these environmental models of competitive advantage have assumed that firms within an industry (or firms within a strategic group) are identical in terms of the strategically relevant resources they control and the strategies they pursue (Porter, 1981; Rumelt, 1984; Scherer, 1980). Second, these models assume that should resource heterogeneity develop in an industry or group (perhaps through a new entry), then implementing their strategies would be highly mobile (i.e., they can be bought and sold in factor markets) (Barney, 1986a; Hirshleifer, 1980)[29].

The second area of research has focused either on exploiting internal strengths, through responding to environmental opportunities, while still neutralizing external threats and avoiding internal weaknesses in order to obtain sustained competitive advantages; that is to say, this area of research maintains that the ability of a firm to perform better than its competitors depends on the unique interplay of **human, organizational, and physical resources (or capital) over time** (Barney, 1991; Prahalad and Hamel,

[28] Garriga and Melé(2004) defined that it is oriented towards "stakeholder" or people who affect or are affected by corporate policies and practices (Freeman, 1970), that is to say, it tries to integrate groups with a stake in the firm into the managerial decision-making processes.

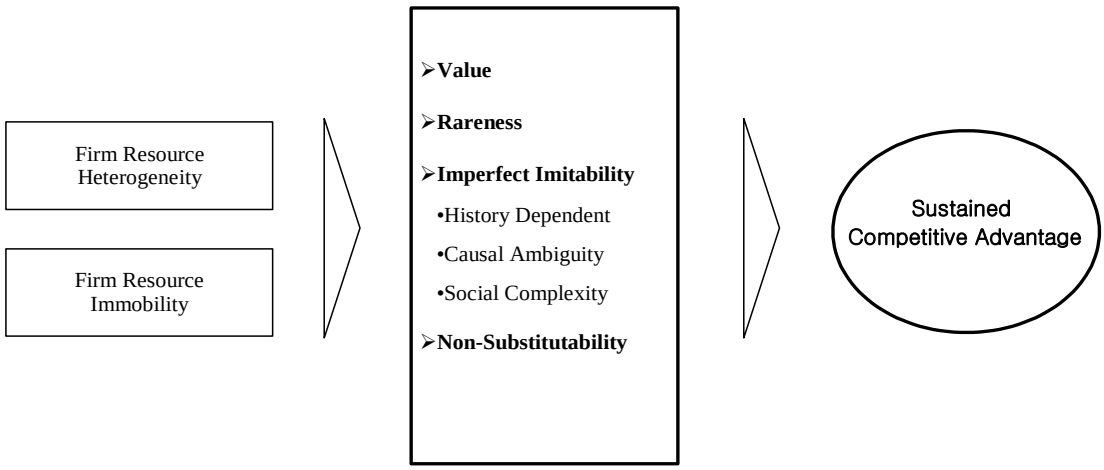
[29] Thus, for example, Porter (1980) suggests that firms should analyze their competitive environment, choose their strategies, and acquire the resources, needed to implement their strategies. Firms are assumed to have the same resources to implement these strategies or to have the same access to theses resources. More recently, Porter (1985) has introduced a language for discussing possible internal organizational attributes that may affect competitive advantage. The relationship between this "value chain" logic and the resource based view of the firm is examined below (Barney, 1991).

1990; Wernerfelt, 1984; Andrews, 1971)[30]. Generally, it is referred to as "The Resource-Base (RB) Model." It posits that above-average returns for any firm for sustained competitive advantage will be largely determined by developing or deploying valuable resources and capabilities which are difficult or impossible for rivals to imitate. In other words, a firm's capabilities or competencies and management abilities to marshal its assets to produce superior performance, determine its competitive advantage (Grant, 1991)[31]. Unlike the IO model, because it examines the link between a firm's internal characteristics and performance, the resource-based view of competitive advantage, obviously can not build on the same assumptions as the IO model. The resource-based view of the firm substitutes two alternate assumptions in analyzing sources of competitive advantage. First, this model assumes that firms within an industry (or group) may be heterogeneous with respect to the strategic resources they control. Second, this model assumes that these resources may not be perfectly mobile across firms, and thus heterogeneity can be long lasting. To have this potential of sustained competitive advantages, together with **heterogeneity and immobility** assumptions, a firm resource must have four attributes: (a) it must be **valuable**, in the sense that it exploit opportunities to create value for customers and/or neutralizes threats in the firm's environment, (b) it must be **rare**, in the sense that it is possessed by few, if any, among a firm's current and potential competition, (c) it must be **imperfectly imitable**, in the sense that other firms cannot develop easily, usually due to unique historical conditions, causal ambiguity or social complexity and (d) there **cannot be strategically equivalent substitutes for this resource** that are valuable but are neither rare or imperfectly imitable. These attributes of a firm's resources can be thought of as empirical indicators of how heterogeneous and immobile a firm's resources are and thus, how useful these resources are for generating sustained competitive advantages (Barney, 1991). The typical approach is value-chain and value-added analysis. It strives to drive down the cost structure of the business (Low Cost Strategy) and/or to differentiate the product in some way so that consumers value it more and are willing to pay a premium price (Differentiation Strategy).

[30] Barney(1991) argues that various authors have generated lists of firm attributes that may enable firms to conceive of and implement value-creating strategies(Hitt & Ireland, 1986; Thompson & Strickland, 1987). For purposes of this discussion, these numerous possible firm resources can be conveniently classified into three categories; **Physical capital resources**(Williamson, 1975),which includes the physical technology used in a firm, a firm's plant and equipment, its geographic location, and its access to raw material, **human capital resources** (Becker, 1964), which include training, experience, judgment, intelligence, relationships, and insight of individual managers and workers in a firm, and **organizational capital resources**(Tomer, 1987), which include a firm's formal reporting structure, its formal and informal planning, controlling and coordinating systems, as well as informal relations among groups within a firm and between a firm and those in its environment.

[31] Grant (1991) classified resources as tangible, intangible, and personnel-based in the resource-based view. Tangible resources include financial reserves and physical resources such as plant, equipment, and stocks of raw materials. Intangible resources include reputation, technology, and human resources; the latter include culture, the training and expertise of employees, and their commitment and loyalty

Figure 2.1 Barney's model for sustained competitive advantage



Source: Barney (1991)

Barney (1991) argues that the last requirement for a firm's resource to be a source of sustained competitive advantage is that there must be no strategically equivalent valuable resources that are themselves either not rare or imitable. It means that being non-substitutable, which is the case of rare or imperfectly imitable, is a crucial requirement for sustained competitive advantage.

Table 2.1 Criteria for sustainable competitive advantage

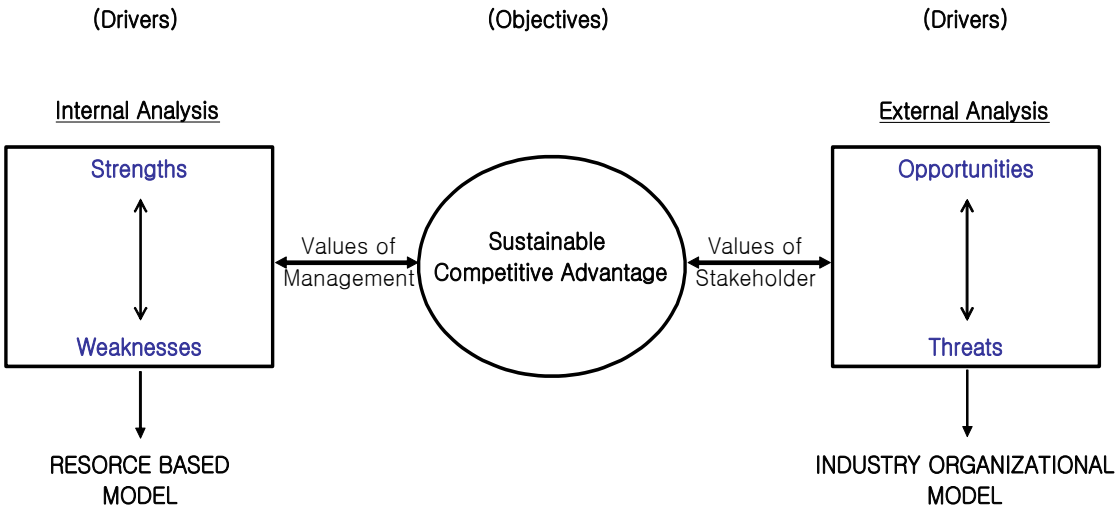
Valuable	Rare	Imperfectly Imitable	Non-substitutable	Competitive Consequences	Performance Implication
No	No	No	No	Competitive Disadvantage	Below Average Returns
	Yes	No	Yes	Competitive Parity, but Possibility of Temporary Competitive Advantage	Average Returns
	No	Yes			
Yes	No	No	No	Competitive Parity	Average Returns
	Yes	No	Yes	Temporary Competitive Advantage	
	No	Yes			
No	Yes	Yes	Yes	Competitive Parity, but Possibility of Competitive Advantage	Average Returns
Yes	Yes	Yes	Yes	Sustainable Competitive Advantage	Above Average Returns

Source: Barney (1991)

In addition, products and resources are two sides of the same coin for the firm. Most products require

the services of several resources and most resource can be used in several products. By specifying the size of the firm's activity in different product markets, it is possible to infer the minimum necessary resource commitments. Conversely, by specifying a resource profile for a firm, it is possible to find the optimal product-market activities. Both perspectives on the firm are reflected in the literature on strategic management (Wernerfelt, 1984), and are highly important in sustained competitive advantage perspectives. It was collectively determined how a business positions itself to create and capture economic value for its owners and stakeholders through the efficient and effective use of its resources and capabilities (analysis of internal environment: RB Model) and organization and control structure (analysis of external environment: IO Model); that is to say, to achieve superior economic performance, a firm has to create a sustainable competitive advantage. It is achieved by a value-creating and value–capturing strategy that cannot be easily duplicated.

Figure 2.2 Relationship between traditional "SWOT (strengths-weakness-opportunities-threat)" analysis, the Resource Based model, and Industrial Organization model



Source: Revision based on Barney (1991)

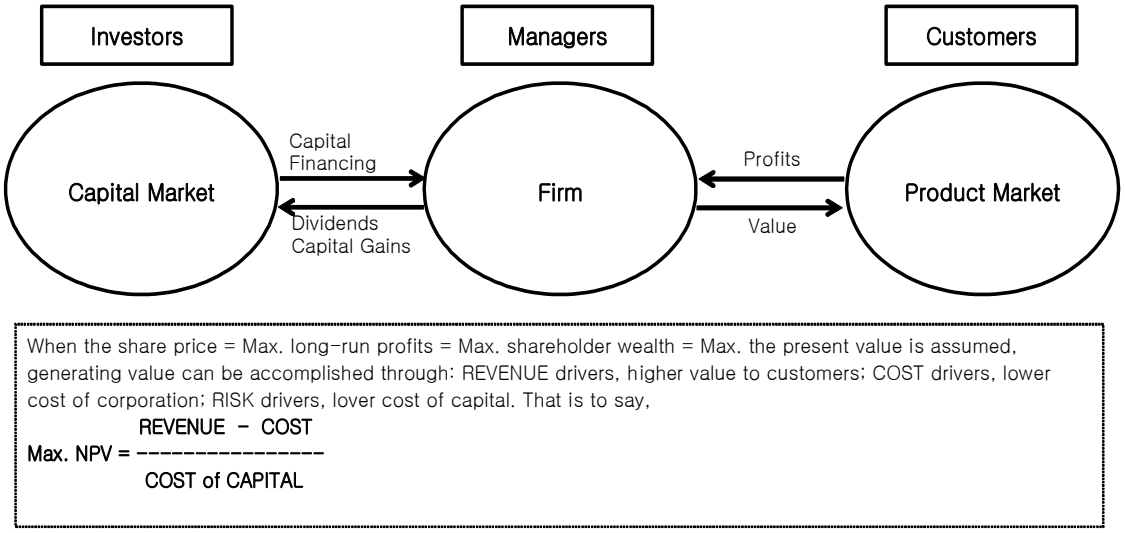
Value for a firm will be maximized if a firm achieves higher value for the customer in the product market, lower costs of operation, and lower costs of capital in the capital market. This is a basic financial model of the firm in strategic management (see figure 2.3).

IO theory and RB theory have been revised for explaining sustainable competitive advantage. Garriga and Melé (2004) identified three main groups of instrumental theories for Corporate Sustainability Management, depending on the economic objective proposed. In the first group, the objective is the maximization of shareholder value, measured by the share price. Frequently, this leads to a short-term profits orientation[32]. The second group of theories focuses on the strategic goal of achieving competitive

[32] Garriga and Melé(2004) stated that a representative of this approach is the well-known Friedman view that "the

advantages, which would produce long-term profits. The third is related to cause-related marketing and is very close to the second (Garriag and Melé, 2004, p. 53)[33].

Figure 2.3 Basic Financial Model of the Firm in Strategic Management



Source: POSRI Workshop (Jun, 2005) by Kim (Cleveland State University)

The objective of CSM is mainly to reach the long-term profits of a wide range of corporate stakeholders through sustainable competitive advantage (see Chapter 4). Therefore, the second group of strategies is more effective for achieving sustainable competitive advantage, according to the author of this thesis. Theories for achieving sustainable competitive advantage consist of social investment in a competitive context and strategies for the bottom of the economic pyramid, expanded on the basis of the IO model (Porter, 1980, 1985), and a natural resource-based view of the firm and dynamic capabilities, expanded on the basis of the RB model (Barney, 1991; Wernerfelt, 1984; Teece et al., 1997).

Social Investment in a competitive context

Porter and Kramer (2002) have recently applied the well-known Porter model on competitive

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only responsibility of business towards society is the maximization of profits to the shareholders within the legal framework and the ethical custom of the country"(1970). The Agency Theory (Jensen and Meckling, 1976; Ross, 1973) is the most popular way to articulate this perspective. However, today it is quite readily accepted that shareholder value maximization is not incompatible with satisfying certain interests of people with a stake in the firm (stakeholder). In this respect, Jensen (2000) has proposed what he calls 'enlightened value maximization'. This concept specifies long-term value maximization or value-seeking as the firm's objective. At the same time, this objective is employed as the criterion for making the requisite tradeoffs among its stakeholders.

[33] Cause-related marketing has been defined as "the process of formulating and implementing marketing activities that are characterized by an offer from the firm to contribute a specified amount to a designated cause when customers engage in revenue-providing exchanges that satisfy organizational and individual objectives (Varadarajan and Menon, 1988, p. 60). Its goal then is to enhance company revenues and sales or customer relationship by building the brand through the acquisition of, and association with the ethical dimension or social responsibility dimension (Murray and Moutanari, 1986; Varadarajan and Menon, 1988).

advantage (Porter, 1980) to consider investment in areas they call competitive context. It consists of four interrelated elements of the local business environment that shape potential productivity. The first element is the factor condition, which involves employee education, natural resources, high quality technological institutions and physical infrastructure. The second element is related to demand conditions; that is to say, how the firm can influence the quality and the size of the local market by, for example, developing educated and demanding customers. The third element, the context for strategy and rivalry, involves how the firm can invest in incentives and norms that rule competition as for example all the efforts for reducing corruption, preventing the formation of cartels and opening markets, The last is the firm's investment in related and supporting industries, for example, strengthening the relationship with suppliers of services, components and machinery.

The authors argue that investing in philanthropic activities may be the only way to improve the context of competitive advantage of a firm and that usually creates greater social value than individual donors or government's can. The reason presented – the opposite of Friedman's position – is that the firm has the knowledge and resources for a better understanding of how to solve some problems related to its mission. As Burke and Lodgson (1996) point out, when philanthropic activities are closer to the company's mission, they create greater wealth than other kinds of donations. That is what happens, e.g., when a telecommunications company is teaching computer network administration to students of the local community. Porter and Kramer (2002, pp. 60~61) conclude, "philanthropic investments by members of clusters of companies, either individually or collectively, can have a powerful effect on the cluster's competitiveness and the performance of all its constituent companies (Gariga and Melé, 2004).

Strategies for the bottom of the economic pyramid

Traditionally, most business strategies are focused on targeting products at upper and middle-class people, but most of the world's population is poor or lower-middle class. At the bottom of the economic pyramid there may be as many as 4 billion people. On reflection, certain strategies can serve the poor and simultaneously make profits for the companies. Prahalad (2002), analyzing the Indian experience, has suggested some mind-set changes for converting the poor into active consumers. The first of these is seeing the poor as an opportunity to innovate rather than as a problem.

A specific means for attending to the bottom of the economic pyramid is disruptive innovation. Disruptive innovations (Christensen and Overdorf, 2000; Christensen et al., 2001) are products or services that do not have the same capabilities and conditions as those being used by customers in the mainstream markets; as a result they can be introduced only for new or less demanding applications among non-traditional customers, with a low-cost production and adapted to the necessities of the population. For example, a telecommunications company investing in a small cellular telephone system with lower costs but also with less service attends to the base of the economic pyramid.

Disruptive innovation can improve the social and economic conditions at the "base of the pyramid" and at the same time they create a competitive advantage for the firms in telecommunications, consumer electronics and energy production and many other industries, especially in developing countries (Hart and Christensen, 2002; Prahalad and Hammond, 2002).

(Natural) Resource-based view of the firm and dynamic capabilities

Russo and Fouts (1997)[34] argue that the resource-based view of the firm offers researchers, who have researched the interaction between corporate and economic, environmental and social activities, a tool for refining the analysis of how corporate policy influences the bottom line two reasons. First, the resource-based view has a strong focus on performance as the key outcome variable. Second, like the social responsibility literature, work adopting the resource-based view explicitly recognizes the importance of intangible concepts, such as know-how (Teece, 1980), corporate culture (Barney, 1986), and reputation (Hall, 1992).

The resource-based view of the firm (Barney, 1991; Wernerfelt, 1984) maintains that the ability of a firm to perform better than its competitors depends on the unique interplay of human, organizational, and physical resources over time. Traditionally, resources (that are most likely to lead to competitive advantage) are those that meet four criteria: they should be valuable, rare, and inimitable, and the organization must be organized to deploy these resources effectively.

The "dynamic capabilities[35]" approach presents the dynamic aspect of the resources; it is focused on the drivers behind the creation, evolution and recombination of the resources into new sources of competitive advantage (Teece et al., 1997). So dynamic capabilities are organizational and strategic routines, by which managers acquire resources, modify them, integrate them, and recombine them to generate new value-creating strategies. Based on this perspective, several authors have identified social and ethical resources and capabilities that can be a source of competitive advantage, such as the process of moral decision-making (Petrick and Quinn, 2001), the process of perception, deliberation and responsiveness or capacity of adaptation (Litz, 1996) and the development of proper relationships with primary stakeholders: employees, customers, suppliers, and communities (Harrison and St. John, 1996; Hillman and Keim, 2001).

[34]They (1997) considered resources and capabilities in their application of the resource-based view as the following combinations: (1) physical assets and the technologies and skills, (2) human resources and organizational capabilities, which include culture, commitment, and capabilities for integration and communication, and (3) the intangible resources of reputation and political acumen. Especially, they argue that, as the resources classified by Grant (1991) are not productive on their own, their analysis needs to consider a firm's organizational capabilities – its abilities to assemble, integrate, and manage these bundles of resources.

[35]Teece et al. (1997) define dynamic capabilities as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization's ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions (Leonard-Barton, 1992).

A more complete model of the 'Resource-Base View of the Firm' has been presented by Hart (1995) for sustainable competitive advantage. It includes aspects of dynamic capabilities and a link with the external environment. He argues that the most important drivers for new resource and capabilities development will be constraints and challenges posed by the natural biophysical environment. His theory is called "a natural-resource-based view of the firm." He developed the conceptual framework with three main interconnected strategic capabilities: pollution prevention, product stewardship and sustainable development. He considers a firm's critical resources to be the capacity to achieve continuous improvement or sustainability, stakeholder integration and shared vision (see Table 2.2).

Table 2.2 A Natural-Resource-Based View: Conceptual Framework

Strategic Capability	Environmental Driving Force	Key Resource	Competitive Advantage
Pollution Prevention	Minimize emissions, effluents, and waste	Continuous improvement	Lower costs
Product Stewardship	Minimize life-cycle of products	Stakeholder integration	Preempt competitors
Sustainable Development	Minimize environmental burden of firm growth and development	Shared vision	Future position

Source: Hart (1995)

Based on these theories, researchers have strongly demonstrated the reasons for the private sector, namely the corporation, to be concerned with sustainability in these areas. Of these, an increasing number shows a positive correlation between improved sustainability performance on the economic, environmental and social dimensions, and financial performance of corporations in most cases (Hart and Ahuja 1996; Frooman, 1997; Griffin and Mahon, 1997; Schaltegger and Figge 1997; Waddock and Graves, 1997; Key and Popkin, 1998; Roman et al., 1999; Verschoor, 1999; Ropetto and Austin 2000; SustainAbility/UNEP 2001; Wagner 2001; Schaltegger and Synnestvedt, 2002; Waddock et al. 2002; Jodie Thorpe and Kavita Prakash-Mani, 2003.). However, these findings have to be read with caution since such correlations are difficult to measure (Griffin, 2000; Rowley and Berman, 2000). To date, in fact, almost all research has been focused on developed markets.

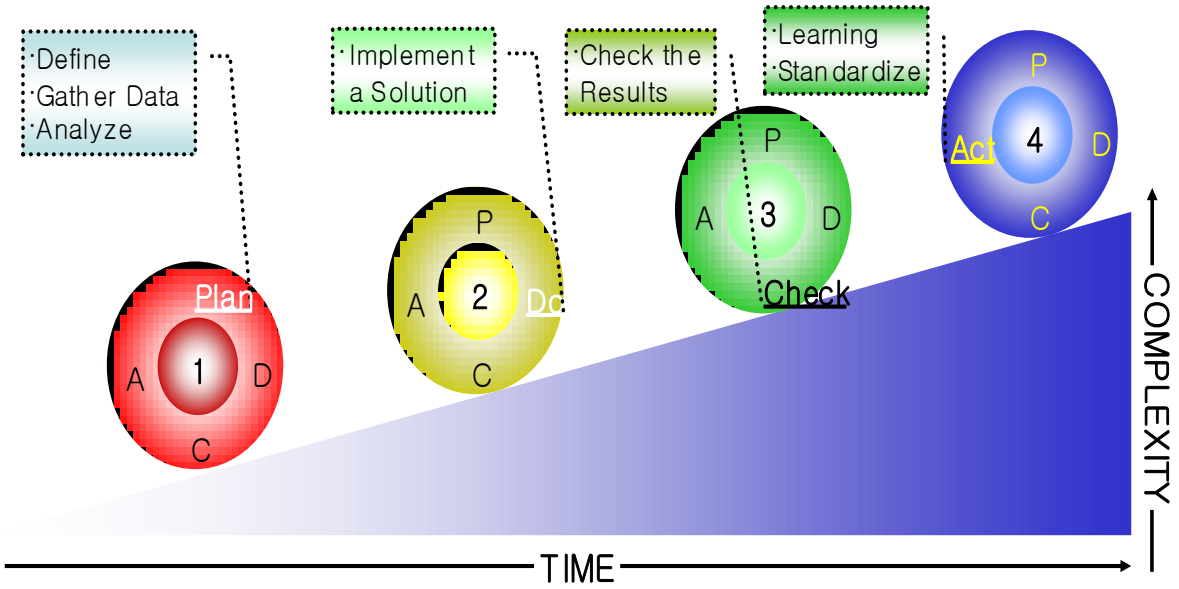
Based on the IO and RB theories, the Plan-Do-Check-Act approach (hereafter, the PDCA Model[36]) is highly useful. The PDCA can be regarded as a management tool to integrate externalities in strategic management and this normative theoretical perspective can be used to describe what Korean companies do with respect to this integration. As a result, CSM gets firmly fixed and helps ultimately to attain long-

[36] 'The PDCA (also known as PDSA or in Japan as the Demming cycle) Cycle" was originally conceived by Walter Shewhart, who was the eminent statistics expert, in 1930's, and later (also known), named after Dr. Demming, A. Edwards who the Total Quality Management (TQM) guru was. The model provides a framework for the improvement of a process or system. It can be used to guide the entire improvement project, or to develop specific projects once target improvement areas have been identified.

term profit in a strategic management perspective. This approach has been applied as a basic theory of management system standards, used as a foundation for the ISO 9000 series and ISO 14000 series (Organization for International Standardization). This dissertation applies the PDCA Model as a key theory for enhancing corporate competency in sustainability perspective. The dissertation, on the basis of this approach, identifies the status of strategic management for achieving sustainability in key industries (See Chapter 3) and will make checklists for the competency analysis of Korean key industries(See Chapter 4 and 5).

The PDCA model is designed to be used as a dynamic model. The completion of one turn of the cycle flows into the beginning of the next. Following in the spirit of *continuous improvement* in the management performance, the process can always be reanalyzed and a new test of change can begin. This approach emphasizes the continuing, never-ending nature of process improvement. The cycle is a simple feedback loop system. The following shows the tasks involved at each stage;

Figure 2.4 PDCA Model



Source: Revised on the basis of www.dartmouth.edu

- **Plan**: In this phase, analyze what you intend to improve, looking for areas that hold opportunities for change and predicting the results. The first step is to choose areas that offer the most return for the effort you put in or the biggest bang for your buck. To identify these areas for change consider using a Flow chart or Pareto chart.

· Define a Problem or Opportunity.
· Analyze the Situation. Study and define the problem; brainstorm for causes and corrective actions; and think creatively to determine the best approach and best possible corrective action.
· Develop an implementation plan.

- **Do**: Carry out the change or test (preferably on a small scale). Execute the plan, taking small steps in controlled circumstances. Implement the change you decided on in the plan phase.

・Implement corrective action.
・Document the procedures and observations.
・Use data-gathering tools to collect information.

- **Check or Study**: the results. What was learned? What went wrong? Take action to standardize or improve the process. This is a crucial step in the PDCA model. After you have implemented the change for a short time, you must determine how well it is working. Is it really leading to improvement in the way you had hoped? You must decide on several measures with which you can monitor the level of improvement. Run Charts can be helpful with this measurement.

・Analyze information
・Monitor trends.
・Compare obtained results against expected results from the plan.

- **Act**: Adopt the change, abandon it, or run through the cycle again. After planning a change, implementing and then monitoring it, you must decide whether it is worth continuing that particular change. If it consumed too much of your time, was difficult to adhere to, or even led to no improvement, you may consider aborting the change and planning a new one. However, if the change led to a desirable improvement or outcome, you may consider expanding the trial to a different area, or slightly increasing your complexity. This sends you back into the Plan phase and can be the beginning of the ramp of improvement.

・If the results are as expected, do nothing.
・If the results are not as expected, repeat the plan/do/check/act cycle.
・Document the process and the revised plan.

Figure 2.5 and 2.6 present theoretical perspectives of the dissertation. Figure 2.5 provides the relations among drivers, theoretical perspectives for responses, and the results. In order to contribute to sustainable development and, ultimately achieve sustainable competitive advantage and create corporate value, the firm must efficiently internalize external costs (social costs) related to sustainable development, so that social costs by environmental pollutants and labor conditions will be minimized. The Piguvian taxes by the government and the Coase theorem of voluntary negotiation between interested parties are the representative pressure factors. In addition, a wide range of regulations are driving forces which the firm should accept for strategic sustainability management. As a theoretical perspective for internalization of externalities based on the (natural) resource-based view and dynamic compatibilities should be pursued in order to emphasize building sustainable competitive advantages through capturing entrepreneurial rents stemming from the fundamental firm-level efficiency advantage (Teece et al., 1997) in strategic management perspectives. Moreover, the defensible direction or positioning of strategic sustainability management against competitive forces should be determined

based on the analysis of external conditions in the TBL perspective. Namely, when a firm internalizes its social costs stemming from the requirement of stakeholders, it should take a proper position based on external conditions in the TBL perspective. These RB and IO models should be integrated through the PDCA model, dynamic approach, in order to enhance corporate capabilities in TBLs perspective. As a result, a PDCA model that embeds the RB and IO models leads either to enhanced operational effectiveness/efficiency or to superior strategic positioning, ultimately achieving sustainable competitive advantage through creation or enhancement of corporate value.

Figure 2.5 Theoretical Perspectives in the dissertation[37]

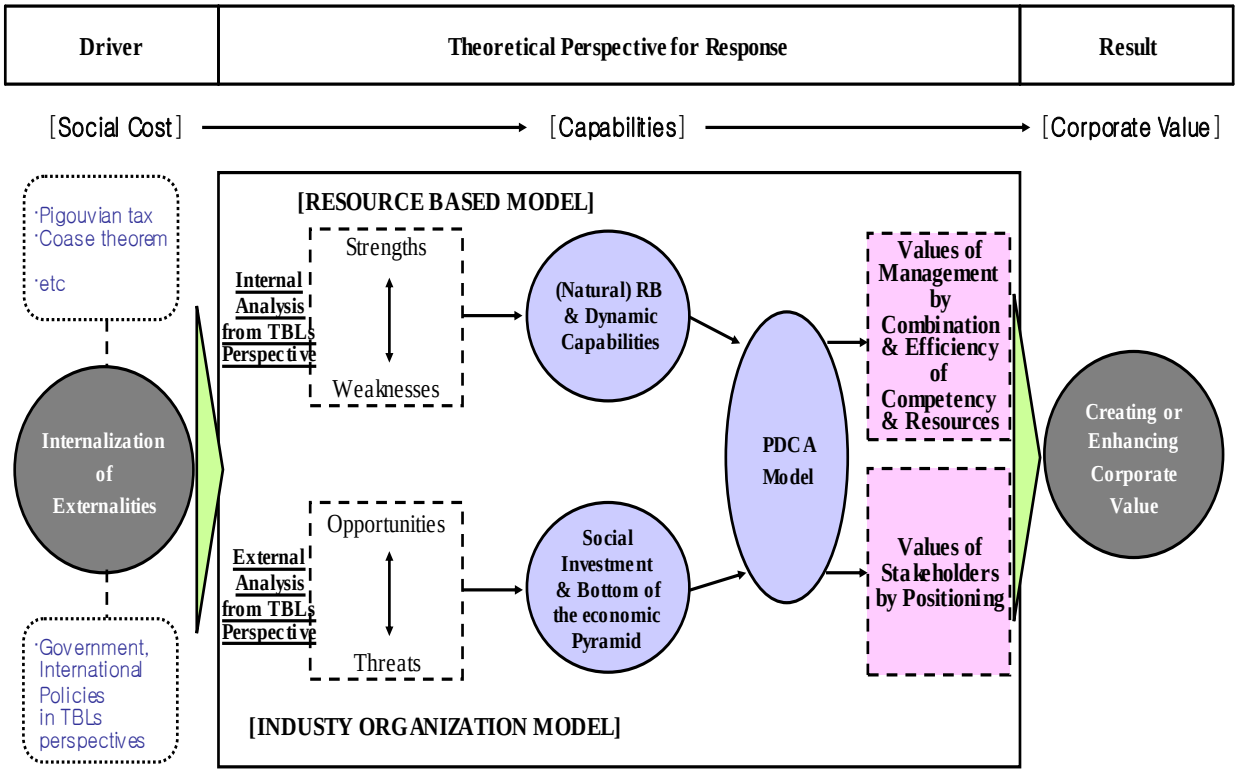
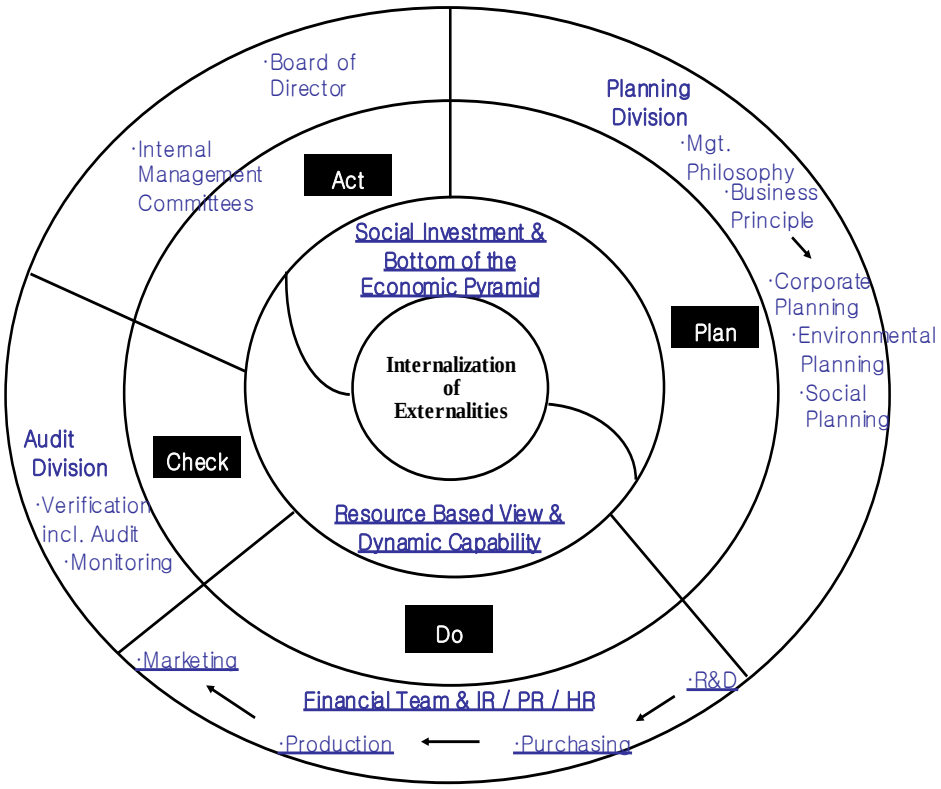


Figure 2.5 shows the linkage between the theoretical perspective and each division of the firm focusing on the PDCA model. It means that internalization of externalities is the core pressure for corporate sustainability, and is closely connected with RB and IO model for sustainable competitive advantage. The IO is mainly related to the Plan and Act stage in the PDCA model, and the RB view is primarily related to the Do and Check stage (including connection with a part of the Plan and Act stage).

[37] Theoretical perspective in the dissertation posits that corporate sustainability will be new management paradigm in the 21 century (see chapter 1). It means that corporate competitiveness will be dominated by sustainable competitive advantage on the basis of TBL perspective. CVMS model presented in Chapter 4 will strive to seek any evidence which activities for corporate sustainability will be helpful to enhance corporate value. Particularly, if all the information about corporate sustainability can be publicly, CVMS model is highly useful for understanding direction of corporate value. However, the bankruptcy will be possible due to unexpected variables. In this case, CVMS model will be useless as one of techniques to measure direction of corporate value.

Finally, each stage of the PDCA model is directly connected with the relevant division in corporate value perspectives (See figure 2.6)

Figure 2.6 Linkages between internalization of externalities and the PDCA Framework



2.3 Research Methodology in the dissertation

In contrast to general management, which is concerned primarily with internal operations, strategic management is concerned with the external circumstances as well as internal organization. The purpose of strategic management is to match the organization's internal capability with external opportunities and threats to formulate strategies that will achieve basic goals and maintain organizational values (Rowe et al, 1989). Accordingly, the research task in strategic management is to generate appropriate tools or accurate information for use in strategic decision-making in order to achieve goals and sustain values within the external constraints. The emphasis of business research has been on shifting business decision-makers from intuitive information-gathering to systematic and objective investigation (Zikmund, 1991). The prime managerial value of business research is thus; to reduce uncertainty by providing information that improves the decision-making process as part of the development and implementation of a strategy. In general, business research is defined as the systematic and objective gathering, recording, and analyzing of data for aid in making business decisions (Churchill, 1983; Zikmund, 1991).

In practice, there are a number of situations in which business-decision topics can benefit from research efforts. In many cases, researchers will know what their problems are and will design studies to test specific hypotheses; in this situation, the problem is fully defined and an experiment may be designed to answer the questions without much preliminary investigation. In another circumstance, at the other end of the uncertainty continuum, researchers or business managers may be totally unaware of the nature of a problem; in this case exploratory research may be necessary to gain insights into the nature of the problem (B.W. Lee, 1995).

In terms of fundamental objectives, business research like other social science studies may fall into some broad groupings (Selltiz et al, 1976; Zimmund, 1991); (a) to gain familiarity with a phenomenon or to achieve new insights into it, often in order to formulate a more precise research problem or to develop hypotheses; (b) to portray accurately the characteristics of a particular individual, situation, or group (with or without specific initial hypotheses about the nature of these characteristics); (c) to determine the frequency with which something occurs or with which it is associated with something else (usually, but not always, with a specific initial hypothesis); and (d) to test a hypothesis of a causal relationship between variables(B.W. Lee, 1995).

In studies that have the first purpose listed above, generally called *exploratory studies*, the major emphasis is on discovering ideas and insights; therefore, the research design must be flexible enough to permit the consideration of many different aspects of a phenomenon. Exploratory studies are normally conducted to clarify the nature of problems. Management may have discovered general problem, but research is needed to gain better understanding of the dimensions of the problem; and management needs information to help analyze a situation, but conductive evidence to determine a particular course of action is not the purpose of exploratory research. Usually, exploratory research is conducted with the expectation that subsequent research will follow to provide conclusive evidence (Selltiz et al, 1976; Zikmund, 1991).

In studies having the second and third purposes listed above, a major consideration is *accuracy*. Therefore, a design is needed that will minimize *bias* and maximize the *reliability* of the evidence collected. Theses studies can be grouped together and are called *descriptive research*. The major purpose of descriptive research is to describe characteristics of a population or phenomenon; and the research seeks to determine the answers to who, what, when, where, and how questions. Unlike exploratory studies, descriptive research is based on some previous understanding of the nature of the research problem. Because the aim is to obtain complete and accurate information, the procedures to be used in descriptive study must be carefully planned; and the research design must make much more provision for protection against bias than is required in exploratory studies. Because of the amount of work frequently involved in descriptive studies, concern with economy of research effort is also extremely important (Selltiz et al, 1976; Zikmund, 1991).

Studies testing causal hypotheses, related to the fourth purpose listed above require procedures that not only reduce bias and increase reliability but also permit inferences about causality. Experiments are especially suited to meeting this latter requirement. However, many studies concerned with testing hypotheses about causal relationships cannot be cast in the form of experiments (Selltiz et al, 1976). Even though it is difficult to identify alternatives or complex causal factors within the complex situation in which business managers operate, most basic scientific studies in business management ultimately seek to identify cause-and-effect relationships.

Table 2.3 Matching Research Type with Strategy and Technique

Type of Research	Purpose of the Study	Research Strategy	Data Collection Technique	Data Analysis Method
Exploratory Study	·to gain familiarity with little understand phenomena; ·to achieve new insights into the phenomena; ·to identify/ discover important variables; ·to generate hypotheses for further research	·literature review; ·experience survey ·case study	·participant observation; ·in-depth interview; ·elite interview; ·document analysis	·interpretation; ·insight categorization; ·cross-tabulation
Descriptive[38] Study	·to describe the forces causing the phenomenon in question; ·to satisfy plausible causal networks shaping the phenomenon; ·to document the phenomenon of interest	·longitudinal analysis; ·cross-sectional analysis	·participant observation; ·in-depth/ structured interview; ·document analysis; ·survey questionnaire	·factor analysis; ·semantic differentials; ·multi-dimensional scaling
Causal Testing	·to establish the appropriate causal order or sequence of events; ·to measure the concomitant variation between the presumed cause and effect; ·to recognize the presence or absence of alternative plausible explanations or causal factors	·experiment; ·quasi-experiment	·survey questionnaire (large sample); ·kinesic/ proxemic; ·content analysis;	·statistical test; ·correlation analysis of variance; ·multiple regression; ·simultaneous regression

Source: B.W Lee, 1995; Yin, 1994 and 2003.

In practice, these three different types of study are not always precisely distinguishable. Any given research may have in its elements two or more of the functions described above as characterizing

[38]The literature regarding descriptive research reveals two significant shortcomings; firstly, there is a clear lack of comparative approaches, and secondly, even fewer studies have explicitly concentrated on the BCS as a driver of CSM, i.e. what determines the BCS, how strong is the need for it?(Salzmann, 2005)

different types of study. In any single study, however, the primary emphasis is usually on only one of these functions, and the study can be thought of as falling into the category corresponding to its major function. Although the distinctions among the different types of study are not clear-cut, it is useful to make them for the purpose of discussing appropriate research designs (Selltiz et al, 1976). There is a wide range of research techniques for each research type. Addressing the categories shown in Table 2.3 will help the researcher make decisions on overall research strategy, the most useful data collection techniques and data analysis method.

In general, however, the decision for research method can be made depending upon three conditions (Yin, 1994, 2003; Maanen, 1993): (a) the type of research objective or question posed; (b) the extent of control a researcher has over actual events; and (c) the degree of focus on contemporary as opposed to historical phenomena. Particularly, according to Yin (1994, 2003), case studies are the preferred research strategy when the research is of an exploratory type with 'why' or 'how' questions, when the researcher has little control over actual events, and when the focus is on contemporary phenomena within some real-life context.

From these three points of view, the three research questions and objectives of this dissertation listed below are compatible with the exploratory study type including literature review and case study as a research strategy presented in Table 2.3. That is to say, the type of research question is applicable to questions of 'why' and 'how'. In addition, it has been suggested as a suitable approach for examining organizational phenomena in-depth, particularly in research areas like strategic management, where access to information in contemporary organizations is sensitive(B.W, Lee, 1995).

RQ1 and OBJ1

- (RQ1) What factors should be considered for strategic corporate sustainability (in Korean business circles)?
- (OBJ1) To provide insight into definitions and concepts, identification of core factors, and a strategic framework for corporate sustainability management. In addition, to provide insight about a conceptual matrix to confirm the relationship between the business factors and environmental and social factors, and to measure corporate value in sustainability perspective.

RQ2 and OBJ2

- (RQ2) Is the direction of corporate sustainability strategy in Korean companies appropriate for sustainable growth of the companies?
- (OBJ2) To provide relevant empirical evidence for the judgment whether the direction of sustainability strategy considering external opportunities and threats is right or not for the company.

RQ3 and OBJ3

- (RQ3) Why have Korean companies tried to integrate sustainability into corporate strategy?
- (OBJ3) To provide relevant empirical evidence for the validity that corporate sustainability management is significantly helpful to enhance corporate value in sustainability perspectives.

In addition, the basic reason that this dissertation relied on these types of methods is that it is more oriented towards strategic management. Particularly, the dissertation focuses on finding a business case study to get insight into the linkage between strategic sustainability management and corporate value. The purpose of strategic management is to match the organization's internal capability with external opportunities and threats to formulate strategies that will achieve basic goals and maintain organizational values (Rowe et al, 1989). Accordingly, the research task in strategic management is to generate appropriate tools or accurate information for use in strategic decision-making in order to achieve goals and sustain values within the external constraints (B.W. Lee, 1995).

The following literature provides insight on the tools which several scholars, think-tanks and consultancies have used in order to find the business case study (BCS). Their efforts can be broadly divided into three categories; (1) Collections of evidence on the BCS and broad recommendations for actions; (2) "Coaching" tools that serve as a detailed roadmap for managers on how to build their BCS; and (3) Valuation tools that are designed to quantify the BCS (see Table 2.4, 2.5, and 2.6).

Table 2.4 Collection of Evidence and Broad Recommendations for Actions

Tool/Project	Description
Earth enterprise tool kit (International Institute for Sustainable Development (IISD), 1994)	· Helps companies to "build new kinds of business" · Primarily targets the North American entrepreneur in a small or medium-sized green or sustainable enterprise · Provides "strategic advice and specific, action-oriented suggestions to deal with real business problems" in the areas of consumer markets, green procurement, technology etc. · Includes a list of information sources for follow-up
Conversations with disbelievers (Weiser and Zabaek, 2000)	· Review of almost exclusively quantitative evidence showing when corporate engagement (exclusively referring to the social dimension of sustainability) creates business and social benefits · Target group: "people who seek to persuade skeptical managers and executives" · Features: Assessment tool for evidence collected, and a "data warehouse", based mainly on US and UK examples
Buried treasure: Uncovering the business case for sustainability (Sustainability, 2001)	· Systemizes the BCS in "The Sustainable Business Value Matrix" along two dimensions: business success (financial performance, financial drivers) and corporate SD(sustainable development) · Links business success and corporate SD performance through logical arguments and corresponding empirical evidence
Multiple Levels of Corporate Sustainability (Van Marrewijk and Were, 2003)	· Various definitions and forms of sustainability each linked to specific (societal) circumstances and related value systems. · A full sustainability matrix shows six types of organizations in different developmental stages and four corporate dimensions [Principles, People, Planet and Profit] · It can be used as a model for a corporate sustainability (self) – assessment tool

Source: Salzmann (2005)

Table 2.5 Coaching Tools

Tool/Project	Description
To whose profit? Building a business case for sustainability (WWF-UK, 2001)	· Designed to "guide senior managers as they work towards building their own business case" · Reviews existing evidence supporting the BCS · Provides a route map towards the BCS, which consists of six steps ranging from (1) identifying impacts to (6) determining preferred actions for inclusion in a business case · Methodologies for every step are included and briefly explained
Die Compass-Methodik. Companies and sectors path to sustainability (Kundt and Liedtke, 1999)	· Originally developed for product lines and regions · Is comprised of 5 modules including COMPASS profile, vision, analysis, management and report · The management module assists with building the business case internally and with operational roll-out (e.g. cost and resource management, stakeholder dialogue, conflict management)
The Sigma Project – putting sustainability into practice (BSI, Accountability, Forum for the Future, 2001)	· Developed guidelines which help organizations to: Effectively meet challenges posed by social, environmental and economic dilemmas, threats and opportunities and become architects of a sustainable future · Consists of the guidelines and 14 tool modules · The business case tool provides a simple process to develop an organization-specific case for addressing sustainability

Source: Salzmann (2005)

Table 2.6 Valuation Tools

Tool/Project	Description
Pure profit: The financial implications of environmental performance (Repetto and Austin, 2000)	· Scenario-based methodology uses standard techniques of financial analysis to derive measures of expected environmental impacts on share values and financial measures of environmental risk · Applied to 13 major US pulp and paper industry companies · Findings: Even though the underlying scenarios and probability assumptions are the same for all companies, risk exposure and financial implications differed significantly from company to company in terms of the most likely outcome (mean), the range of possible outcomes (variance) and their degree of imbalance towards negative and positive outcomes skewness
Stalking the elusive business case for corporate sustainability (Reed, 2001)	· Elaborates on the fundamentals of the BCS · Describes several conventional valuation methodologies and emerging methods to quantify the BCS financially

Source: Salzmann (2005)

All three approaches are worthwhile and provide complementary means of increasing managerial understanding of the BCS. However, the following issues and stumbling blocks remain (Salzmann, 2005):

- Collections of evidence and recommendations for action commonly rely on more general and partly anecdotal data. They are not very effective at facilitation of managers' decision-making in a specific situation because of the complexity of the BCS, which varies across several dimensions such as industries and plants.

- Coaching tools attempt to fill this void by providing managers with guidelines, checklists and other methodologies. Some of those tools such as WWF's route map towards the business case are very comprehensive. However, two essential questions remain; *firstly*, how much are coaching tools applied in practice? The most obvious barriers to their application are the tools themselves (too general, too specific, too technical, etc.) and their users, i.e. the managers (time pressure, reactive mindsets and lack of knowledge). Besides, one should not rule out an even more essential barrier in advance; the tools may not be needed as much as scholars and consultants expect. This leads us to the *second* open question; do coaching tools (or tools in general) represent the most effective approach to promoting corporate sustainability management? In this respect, more empirical research into the internal barriers and the exact needs of managers for the BCS is clearly needed.
- Valuation methodologies are less well known and are seldom used in the business community. This is presumably because they are new and demanding, and may thus; overwhelm managers who lack the necessary financial expertise. And, because of the complexity of environmental and social issues, there may be insufficient mechanisms to gather and organize the data required (Reed, 2001, p.3).

Salzmann (2005) argues that the BCS as a research topic should be inherently linked to two major stumbling blocks, which may also prevent more conclusive results of quantitative instrumental studies in the future;

- Complexity: The nature of the BCS is extremely complex since it is contingent on a number of parameters (e.g., technology, regime and visibility) that vary between industries, plants, countries and different points in time.
- Materiality: The BCS may exist but may often be marginal in practice and/or difficult to detect. It appears to be mostly limited to the reduction of downside operational risk and to measures to increase eco-efficiency, the "no-brainers" of good (rather than corporate sustainability) management. The economic value of more sustainable business strategies is a lot more elusive, since it only on intangible assets (e.g., brand value, employee loyalty) are difficult to quantify.

Business research, like other forms of scientific inquiry, is a sequence of highly interrelated activities that overlap continuously rather than follow a strictly prescribed sequence. Nevertheless, business research often follows the generalized stages (Zikmund, 1991); (a) defining the problem; (b) research design; (c) sampling; (d) data collection; (e) analysis; (f) concluding and reporting. In practice, the stages overlap chronologically and are functionally interrelated. In line with the research process, a specific research strategy and data collection technique should be determined after the design of the above-mentioned research type. Sections 2.3.1 and 2.3.2 sections present, in detail, according to the above research process, the research strategy, date collection techniques and data analysis methods are presented for each research objective applied of the dissertation.

Using the insights gained from the literature review and interpretation that is presented in Chapters 3

and 4 as a conceptual or theoretical frame of reference, the first research question is explored. The last two research questions are explored based upon the case study in Chapter 5.

2.3.1 Literature Review

The literature review, as a key research strategy for exploratory research is well designed in order to help the researcher gain familiarity with a phenomenon or to achieve new insights into it, often in order to formulate a more precise research problem or to develop hypotheses (Selltiz et al, 1976; Zimmund, 1991). A literature review is an account of what has been published on a topic by accredited scholars and researchers. Providing the literature review is designed to convey to your readers what knowledge and ideas have been established on a topic, and what their strengths and weaknesses are. As a piece of writing, the literature review must be defined by a guiding concept (e.g., your research objective, the problem or issue you are discussing or your argumentative thesis) (Dena Talyor, 2005).

1) State of the Art of Korean Industry with regard to sustainability management

In order to better understand sustainable management, the *'state of the art,'* of Korean industry including foreign companies which are in the same industrial sector with those of Korean industry, the first part of this dissertation examines the *'state of the art,'* of Korea, Korean industry, the country's policies related to sustainable industry, and the sustainable activities of key companies in Plan-Do-Check-Act perspectives. This dissertation refers to recent results announced by international organizations on the evaluation of sustainability perspectives, data prepared mainly by Korean governments on economy, environment, and society, and information acquired in the Annual Report and sustainability report of each company and by personal interviews.

From the late 1990s onwards, the business circles in the world have seen the rapid growth of concern regarding business and social and environmental factor integration, and the rapid increase of sustainability reports reflects this trend in perception or awareness and endeavors (see http:// www.globalreporting.org or http://www.corporateregister.com). Particularly, various policies for sustainability developed by international organizations such as the EU, OECD, ISO and each country in the world have heavily impacted business and management behaviors of business circles, mainly globally leading companies.

Korean industry, being greatly dependent on export, has also had great concern on the relationships between management and the environment since 1996. Furthermore, social responsibility has recently been an emerging issue taken into account in business management in Korea[39]. The ISO 14001, an international standard regarding the environmental management system, established on Sep. 1, 1996,

[39] ISO 26000 (guidance on social responsibility) by ISO has begun preparation from late 2004. According to ISO, it will be finished on the late of 2008. As of Oct. 12, 2006, its stage is the second Working Draft.

provided the actual momentum that stimulated Korean industry to introduce environmental issues into its management. Korean industries, whose exports are very crucial for their sustainability, could not help introducing the ISO 14001, which requires the audit and certification by third parties[40].Together with this trend in Korean industry, various policies and measures of Korean governments for environmental-friendly and sustainable industry had been carried out. Especially, those of Korean governments, according to the principles of international organizations such as the Global Compact by UN Integrated Product Policy by the EU and Guidelines on Sustainability Reports by the GRI, the international conventions such as the Kyoto Protocol for the reduction of Green House Gases and Stockholm Convention related to the ban on hazardous substances, have been implemented gradually so that its industry continues to be environmentally-friendly and sustainable.

This dissertation examines the present status of sustainability in Korea and Korean industry and a wide range of policies and measures related to sustainable industry by the Korean governments over time, which have been encouraging companies' environmental and social awareness. Furthermore, the background and the *'state of the art,'* of the three key companies, which are leading in sustainable management in Korea, were examined based on interviews with the person in charge of sustainability in each company. Other inputs were derived from recent Annual and Sustainability Reports. The insight about the *'state of the art'* regarding their sustainable management was developed and is presented in the thesis in Chapter 3. Sustainable management, defined in the Chapter 4(see 4.2), is basically designed to help companies achieve continuous improvement on the basis of the TBL. Therefore, the systematic and dynamic approach of the Plan-Do-Check-Act Model is very helpful to efficiently achieve these objectives (Walter Shewhart and W. Edwards Deming, 1930 and 1970). Achieving consistency of objectiveness and transparency of sustainable management is also discussed.

This discussion is mainly based upon interviews with key persons of each company, a literature review regarding various research reports and the companies' Annual and Sustainability Reports, and their interpretation. Much of the material which was surveyed is primarily based on recent English language sources presented by international organizations, Korean governments, and each company. However, a part of the material, particularly, regarding the country's situation in TBL perspectives, is based on Korean language sources.

2) Conceptual Definition and Modeling

In order to define corporate sustainability management and to identify its core factors, this dissertation examines the conceptual definition of key terminologies and managerial approaches to sustainability related to corporate sustainability management, the arguments of researchers, and the

[40] According to the ISO survey - 2004 published in the late 2005, as of 2004, the number of certificates of Korean business circles for ISO 14001 is 2,609. They rank tenth among countries for ISO 14001 in the world (World total is 90,569). (www.iso.org)

criteria of rating institutes including indicators developed by GRI in TBL perspectives. This dissertation principally considers recent literature on management and sustainability including strategic management, corporate sustainability, environmental management, corporate social responsibility including corporate citizenship and business ethics, stakeholder management and corporate accountability. In the early 1990s, relevant literature mainly focused on business and the environmental relationships; Social issues such as poverty, social conflict, human rights etc. emerged as a real problem to be solved immediately before and after 2000. Business academy societies in the world have tried to promote their concerns about corporate social responsibility and, more recently, corporate sustainability. As a consequence, a number of academic papers on relationships between business and sustainability have been produced to contribute to sustainable development in the business academy.

This discussion is mainly conducted through literature review and its interpretation. Much of the material which has been surveyed in the dissertation is primarily based on recent English language source, covering a wide range of European and American literature. The sources used include data bases (for literature searching and abstracting), books, academic or industrial journals, seminar materials, conference proceedings, journal articles, company publications (including the Annual and Sustainability Report) and company Web-sites.

To obtain a comprehensive literature, a search was first undertaken of materials from CD-ROM databases (mainly **Pro*Q*uest Information and learning** by UMI which covers over 2,300 academic management, strategic and business journal, and **Science Direct** by Elsevier Science which covers over 1,200 Economics, Business and Management, Social Sciences, Energy and Technology, Engineering, Materials Science, Computer Science) and the Library of POSCO Research Institute (POSRI). Work has regularly been conducted to update the latest materials throughout the whole period of this study. Even though several dozen references were assembled this way, the recent nature of this subject required additional research methods. Consequently, the following approaches for literature review were also followed; (a) consultation of academic journals and books on sustainable development, environmental management, corporate social responsibility including business ethics and corporate citizenship, stakeholder management, corporate accountability and corporate sustainability, (b) collection of papers from a variety of academic seminars and conferences including the International Research Conferences of the Greening of Industry Network, 2004 European Roundtable on Sustainable Consumption and Production, and the conferences of the Korean Environmental Management Association, the Korean Environmental Economy Association and the Korean Environmental Policy Association.

One of the major contributions of this dissertation is to develop a ‘corporate value matrix for sustainability’ in strategic management perspectives. It is primarily based on the concept of corporate sustainability management defined through the literature review and identified by the analysis of researchers and criteria of the rating institute in TBL perspectives (see Chapter 4). The idea for this

dissertation originated from a review of the latest literature (see http://www.inKnowvate.com, 2001; BDI, 2002; Timo W.M. van den Brink, 2002; Ken Smalheiser, 2002; van Marrewijk, Teun W. Hardjono, 2003), especially that concerning the business case for corporate sustainability (Oliver Dudok van Heel, John Elkington, Shelly Fennell, Francekka van DijK, 2001; Thorpe and Prakash-Mani, 2003).

Subsequently, both business as well as environmental and social dimensions, which are two core dimensions of the matrix, were examined and revised or elaborated (see section 4.4 in Chapter 4). Based on the concepts of corporate sustainability management, a 'Corporate Value Matrix for Sustainability' (see Figure 4.6 in Chapter 4) was developed and each segment (cell) of the matrix was evaluated on the basis of the criteria (see Section 4.2 and 4.3 in Chapter 4) in terms of the behavior of corporate sustainability (see Section 5.2.2 and 5.2.3 in Chapter 5).

The pilot study was carried out to investigate the practical validity of the proposed model and the conceptual influence of corporate values by using a set of secondary data including three Korean company cases. The secondary data were mainly obtained from the website of each company, its sustainability reports, facts available on the Korean Stock Market, the results evaluated by SAM DJSI, Korean daily newspapers (e.g. Dong-A ilbo[41]), and opinions from various NGOs. In addition, interviews with team leaders and members of sustainability teams in the Korean companies were carried out several times.

Each segment, which shows the relationship between the business factors (traditionally economic indicators focusing on financial factors) and non-business factors (the transparency factors of economic indicators, social, and environmental factors), are graded as a fourth type according to the criteria based on the theoretical background of corporate sustainability management (see section 2.2 in Chapter 3). In particular, Barney's requirements for sustainable competitive advantage – such as valuable, rare, imperfectly imitable, and non-substitutable resources will be applicable in order to evaluate a firm's activities and industrial structure.

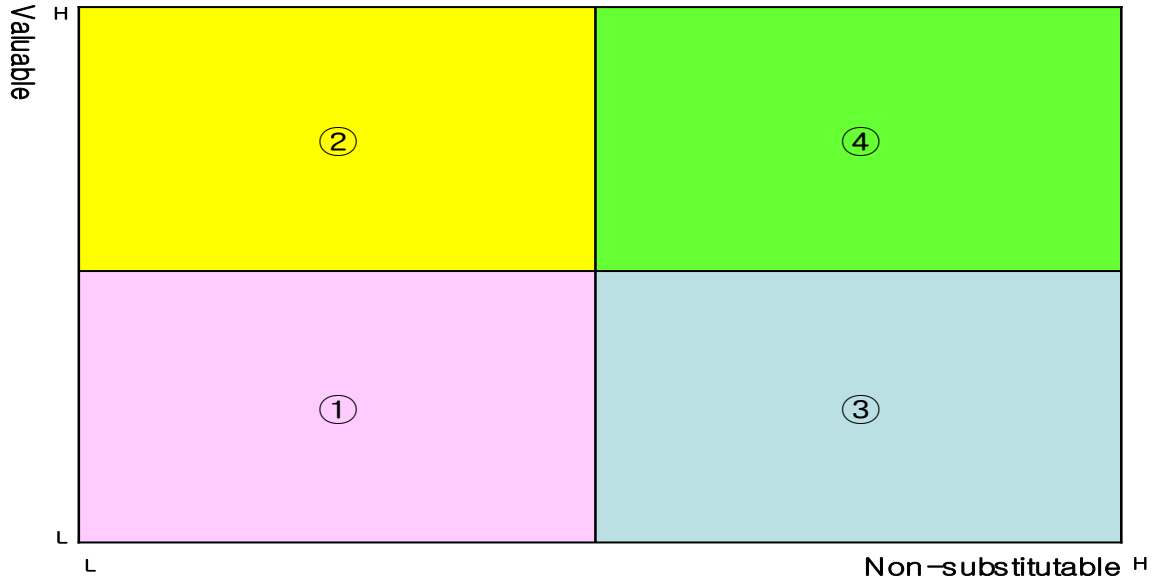
All the activities of the firm and external conditions of industry are evaluated on the basis of figure 2.7. These criteria form the ground for the degree of linkage between traditional business factors (economic capital) and non-business factors (economic capital, environmental capital, and social capital) in sustainability perspectives. The dissertation assumes that, ultimately, as the degree of linkage is stronger, the long-term sustainable competitive advantage will be more advanced. This is illustrated as a sustainability possibility frontier curve[42]. In chapter 5, the author of this dissertation evaluates the

[41] Dong-A ilbo (a daily newspaper in Korea), together with IBM-BCS, has evaluated Korean companies in TBL perspectives since 2003.

[42] Its concept is based on the productivity possibility frontier curve in the production theory field of micro economics. That is to say, it is on the basis of three axes of non-financial factors such as economic, environment, and social capital, and it will be expressed as the degree of linkage between traditional financial factor and the above non-financial factors. This dissertation assumes that, if the sustainability frontier curve tends upwards,

activities of the three Korean companies and presents the results as a type of sustainability frontier curve. The following sections explain the characteristics of each segment:

Figure 2.7 The Evaluation Criteria for the Case Studies



Note: Non-substitutable means either rare or imperfectly imitable activities. See p. 11 of chapter 2 for an understanding of "valuable and non-substitutable." The author of the dissertation evaluates all activities of a firm on the basis of these criteria.

- **Segment** ① (Pink Color) means that all the activities in this segment are low degree or ambiguous in valuable perspectives and low degree in non-substitutable perspectives, taking into consideration the external circumstances as well as the internal organization of a firm, particularly the characteristics of a firm including its industry such as its management philosophy (vision and mission) and culture, strategy, process and products into account. That is to say, all the activities in this segment have a very low degree of the linkage with tradition financial factors therefore, the 'sustainability possibility frontier curve' does not move upwards and can not help a firm to achieve sustainable competitive advantage. It is possible that sustainable competitive advantage will be adversely affected due to wasteful use of firm's resources, cost burdens, etc.
- **Segment** ② (Yellow Color) means that all the activities in this segment are high level in valuable perspectives and are low level or ambiguous in non-substitutable perspectives. That is to say, all the activities in this segment are meaningful in a sustainability context. However, they are easily imitable and are not enough to reflect the external circumstances as well as the internal organizational aspects of a firm, such as its management philosophy (vision and mission) and culture, strategy, process and products. Therefore, it does not have any significant influence on the sustainability possibility frontier curve, and can have a parity impact on sustainable competitive advantage. Still, however, it can have

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corporate value will be improved or enhanced in both the mid and long-term.

a positive effect on sustainable competitive advantage though only temporarily.

- **Segment ③ (Light Blue Color)** means that all the activities in this segment are low level or ambiguous in valuable perspectives and high level in non-substitutable perspective. That is to say, all the activities are original and are not easily imitable with competitors; however, they are not enough to reflect the external circumstances as well as internal organization of a firm such as its management philosophy (vision and mission) and culture, strategy, process and products. Therefore, it can lead to an upward shift of the sustainability possibility frontier curve, and it will contribute positively to sustainable competitive advantage in the long-term.
- **Segment ④ (Green Color)** means that all the activities in this segment are of high level in valuable perspectives and high level in non-substitutable perspectives. That is to say, all the activities are original and are not easily imitable with competitive firms. In addition, they are enough to reflect the external circumstances as well as internal organization of a firm such as its management philosophy (vision and mission) and culture, strategy, process and products. Therefore, it will lead to an upward shift of the sustainability possibility frontier curve, and it will contribute to actual sustainable competitive advantage.

For this analysis: (a) each segment reflects the ordinal number for sustainable competitive advantage, (b) the analysis was performed by the conceptual interpretation of data collected without the analysis of the actual impacts of the activities on the sustainability frontier curve. The reasons for this are that it is currently difficult for these kinds of data to be measured and to apply the stochastic methodology to the model in the study.

2.3.2 Case Study (Empirical Analysis)[43]

This dissertation author adopted the case study as a research strategy. The reasons for this decision, in general, are presented in section 2.4 of Chapter 2, and a wide range of research strategies for doing social science research and the advantages and disadvantages of each research strategy are summarized in Table 2.3 of Chapter 2.

The case study, in this dissertation, was designed to provide relevant evidence for the practical validity of the proposed corporate sustainability value matrix, to confirm the relationships among the business, environmental and social factors and to find the strategic implications of sustainable management; that is to say, the dissertation relies on the collection of evidence and makes broad recommendations for actions or behaviors to be implemented by companies (see 2.3 in Chapter 2).

As industrial sectors for the case studies, the electronics, steel, and automobile industries were chosen due to their prominence in the sustainability arena in Korea. Moreover, these industries in Korea have a

[43] See the further methodological details in Section 5.2 of Chapter 5.

great relationship with foreign markets in selling products and buying raw materials for production. They have recently been the subject of considerable public and legislative scrutiny, especially concerns regarding environmental issues such as hazardous substance use, recycling of products, energy efficiency, and the scarcity of natural resources. It is, therefore, expected that environmental and natural resource concerns in these sectors will have emerged more recently and developed rapidly with more intensity than other less controversial industries. They also will have been given more attention from stakeholders than their counterparts. As a result, it would be expected that the legitimacy and needs of a wide range of stakeholders will have deeply influenced the practice of sustainability management in these industries. This is relevant because these industries in Korea are greatly dependent on overseas markets. Some large Korean companies in these industries have sought to find a larger market abroad and have had their own production facilities and joint ventures in foreign countries. Accordingly, Korean companies in those industries have gone through a number of challenges regarding sustainability, and they should have established strategic sustainability management in advance to efficiently address the various sustainability challenges they have or will have to face.

This dissertation examines the strategic management practices of three Korean companies, one company per key industrial sector mentioned. The three companies are Samsung SDI in the electronics industry, POSCO in the steel industry, and Hyundai in the automobile industry. The three companies are the representative companies in each industry which have made a great contribution to the continuous growth of Korea, and are the leading companies in Korea in sustainability management. Consequently, two companies among this group are included at the Universe of SAM DJSI in 2005. Another reason for choosing these companies is accessibility to empirical data. As of 2005, 6 or 7 companies including public corporations in Korea, which are mainly active in the domestic market, have started to introduce sustainability management into their existing management, and to issue sustainability reports. In 2002, only three companies had proactively published sustainability reports and have since regularly issued sustainability reports that include data related to their sustainability activities.

Additionally, the author of this dissertation has worked for 17 years at the POSCO Research Institute (hereafter, POSRI), which was established by POSCO and has mainly carried out projects funded by POSCO and, accordingly, has a number of personal contacts in its planning division including the environmental planning team and the corporate sustainability team..

Furthermore, this author has a relationship with two companies from contacts established through conferences, and meetings organized by government or industry associations. In the case of Hyundai Motor, the author has been a member of its supply chain environmental management committee since 2003. As a result, it was possible to easily obtain a wide range of data and to ask questions related to this study.

The third reason for choosing these companies is that most companies are quite reluctant to release

data regarding their sustainability activities.

To collect empirical data, this dissertation author adopted the techniques of document analysis and in-depth interviews with supplementary questionnaires (see Appendix B). Even though the interview, which is the most important information source of this case study, is a targeted and insightful data collection technique, it is often subject to the common problem of bias due to poorly constructed questions or inaccuracies due to poor recall or misleading reflexivity (Yin, 1994 and 2003). Therefore, the materials published outside the company (by stakeholders, especially NGOs, in the Korean Stock Market and the results of SAM DJSI etc.) were used to address this bias, and the supplementary questionnaire was also designed to make up for the weaknesses of inaccuracies.

Based on a variety of company publications, document analysis was conducted to gain insight into the company's outline including the production processes, products, and organization and strategic highlights in sustainability perspectives. Subsequently, in-depth interviews with key persons related to sustainability management were conducted several times in order to minimize interview bias. In the case of POSCO, two persons (one is team leader, the other is the highest senior member of the team), who have worked there for over twelve years participated in the in-depth interviews (see Appendix B) for identifying the company's *'state of the art,'* in strategic sustainability management perspectives.

These individuals have worked on a series of teams in conformity with POSCO's value chain such as Procurement, R&D and Technology, Production, and Marketing including support divisions like business planning, human resource, financial, PR, and environmental planning. In addition, data related to POSCO's sustainability activities were extracted from sources such as its website, documents by stakeholders, evaluations by outside institutes, information opened at the stock market, and their sustainability reports.

To analyze the data gathered from documents, interviews, and questionnaires, this dissertation uses methods of interpretation by conceptual criteria (see Chapter 4), cross-tabulation and insight categorization. For each company, CVMS typed by cross-tabulation are compared and discussed between 2002 and 2004 with regard to sustainability management, and the appropriate strategic direction for its sustainability management is presented. Finally, these empirical analyses are conclusively interpreted into the findings and recommendations of the dissertation in Chapter 6 (see Section 6.2).

2.3.3 Limitation of the Research Methodology

Several problems of case study were raised by some researchers. In 1935, there was a public dispute between Columbia University professors, who were championing the scientific method, and The Chicago School and its supporters, who are most identified with case study methodology. The outcome was a victory for Columbia University and the consequent decline in the use of case study as a research

methodology (Tellis, 1997)[44]. Case study as a research strategy applied in this dissertation also has the weaknesses inherent to the case design as follow;

First, cautions are necessary in interpreting the case study. The analysis of the activities in the particular context of the case is obviously subjective, restricted by perceptual biases and certain theoretically informed choices, even though the dissertation established the criteria for analysis in Chapter 2. While the case material support the interpretations made based on the criteria, there is always the possibility that another set of researchers would have reached different conclusions within the same setting. Second, together with subjective interpretations, the modest intervention that was experienced during the research project might be that field-based research cannot divorce itself from the biases of the researchers, particularly in presence of an intrusive research approach typical of any clinical field study. On the other hand, the fact that company's representatives provided positive feedback on the analysis presented in this chapter adds to the robustness of my personal interpretations. Third, the case design could be criticized for the selection of a company that eventually presented idiosyncrasies supporting the theoretical model to be validated. Fourth, as any piece of field research grounded in the events of one empirical site, the study does not allow for generalization across organizations[45].

2.4 Summary and Conclusions

The dissertation examines the theoretical background for CSM in business management perspectives, together with theory of internalization of externalities as a driver for CSM, on the premise that it is a new management paradigm for achieving sustainable competitive advantage in strategic management perspectives (See Chapter 4). The theory of internalization of externalities as a driver for CSM is considered, and the industrial organizational (IO) model (Porter, 1980, 1985) and resource based (RB) model (Barney, 1991; Wernerfelt, 1984; Teece et al., 1997) are presented to explain corporate sustainability management within the context of strategy management. Stakeholders have been expanded from shareholders to a wider range of stakeholders including employees, the community, NGOs, and the government. Social investment in a competitive context and strategies for the bottom of the economic pyramid, (based on the IO model (Porter, 1980, 1985)), and a natural resource-based view

[44] Hamel (Hamel et al., 1993) was careful to reject the criticisms of case study as poorly founded, made in the midst of methodological conflict. He asserted that the drawbacks of case study were not being attacked, rather the immaturity of sociology as a discipline was being displayed. As the use of quantitative methods advanced, the decline of the case study hastened. However, in the 1960s, researchers were becoming concerned about the limitations of quantitative methods. Hence there was a renewed interest in case study (Tellis, 1997).

[45] The key frequent criticism of case study methodology is that its dependence on a single case renders it incapable of providing a generalizing conclusion (Tellis, 1997). Yin (1993) presented Giddens' view that considered case methodology "microscopic" because it "lacked a sufficient number" of cases. Hamel (Hamel et al., 1993) and Yin (1984, 1989a, 1989b, 1993, 1994) forcefully argued that the relative size f the sample whether 2, 10, or 100 cases are used, does not transform a multiple case into a macroscopic study. Yin (19994) pointed out that generalization of results, from either single or multiple designs, is made to theory and not to population. The goal of the study should establish the parameters, and should be applied to all research. In this way, even a single case could be considered acceptable, provided it met the established objective (Tellis, 1997).

of the firm, (based on the RB model (Barney, 1991; Wernerfelt, 1984; Teece et al., 1997)) are mainly discussed in this chapter. Through the analyses, the author of this dissertation confirmed the following:

- CSM is being pursued by companies to obtain maximum profits. However, it is mainly focused on long-term profits, and for purposes to satisfy the needs of a wide range of stakeholders through the maximization of profits. This view however differs considerably from Friedman's position. The Friedman view states that "the only responsibility of business towards society is the maximization of profits to the shareholders within the legal framework and the ethical custom of the country (1970)." Porter and Kramer (2002) argued that investing in philanthropic activities may be the only way to improve the context of competitive advantage of a firm by doing so greater social value can be created, rather than relying on the help from individual donors or the government aid. The reason presented is that the firm has the knowledge and resources for a better understanding of how to solve some problems related to its mission. As Burke and Lodgson (1996) pointed out, when philanthropic activities are closer to the company's mission, they create greater wealth than others kinds of donations.
- The internalization of externalities in economics argues there are three ways for a firm to obtain sustainable competitive advantage; modify its technology, improve its productivity, and reduce its pollutant emissions. Therefore, internalization of externalities is a crucial driver for CSM. At the same time, business management theories for CSM argue that the ability of a firm to perform better than its competitors depends on four interrelated social investment elements for enhancement of potential productivity and the unique interplay of human, organizational, and physical capital resources(Garriga and Melé, 2004). Both theoretical perspectives should be linked with the PDCA model suggested by Shewhart (1930s) and Deming (1970s), which is a dynamic management framework for enhancing inner capabilities and ultimately, achieving sustainable competitive advantage(see Figures 2.5 and 2.6).
- A successful firm which achieves a sustainable competitive advantage over time and creates greater corporate value focuses on the linkage between traditional business factors (economic factors) and non-business factors such as economic, environmental and social factors. This dissertation argues that two dimension should be strongly connected, if possible, for sustainable competitive advantage and the enhancement of corporate value expressed by the sustainability frontier curve. According to Barney (1991), the four criteria for sustainable competitivity (valuable, rare, inimitable, and strategically non-substitutes) may be helpful to decide whether a certain activity will have any effect regarding the degree of linkage between two dimensions (traditional business factors and non-business factors). This dissertation establishes the criteria of two dimensions such as valuable and non-substitutable activities based on Barney's criteria (1991).
- Literature related to the relationship between financial performance and corporate sustainability

management was reviewed. They can be broadly divided into three categories; (1) collections of evidence on the business case study (BCS) and broad recommendations for actions; (2) “coaching” tools that serve as a detailed roadmap for managers on how to build their BCS; and (3) valuation tools that are designed to quantify the BCS. This dissertation focuses on the business case of CSM. It does not cover natural cases and societal cases suggested as a requirement for a truly sustainable company by T.Dyllick and K.Hockerts (2002) (see section 4.4 in Chapter 4). Natural and societal cases are not suitable for this dissertation because this dissertation focuses mainly on the linkage between economic indicators and environmental and social indicators. Sufficiency, ecological equity and social efficiency for natural and societal cases do not exist or have not yet been adequately explored (see Table 2.4~2.6 in section 2.3).

This chapter explains the applied methodologies used in the dissertation together with an introduction of generic methodologies in strategic management. The results of the literature review for a theoretical perspective study are presented, and the data collecting techniques and data analysis used in this study are discussed.

CHAPTER 3. 'STATE-OF-THE-ART,' AT THE FORERUNNERS

3.1 Introduction

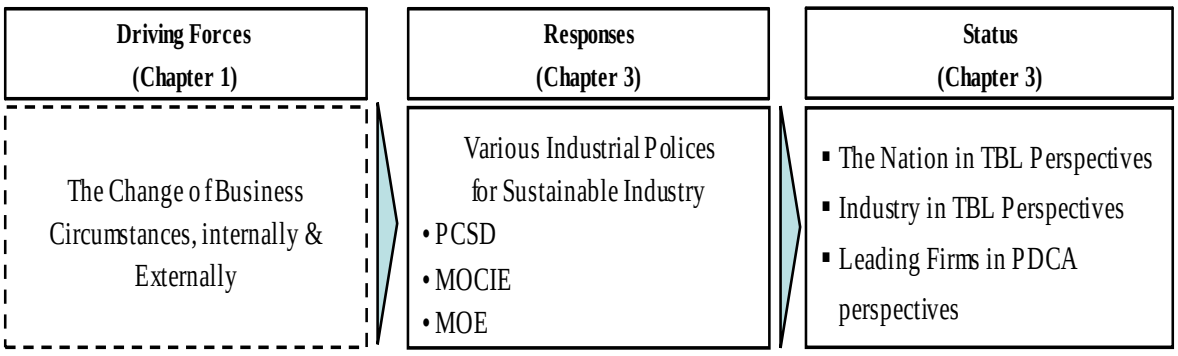
In chapter 2, the author addressed theoretical perspectives, as well as internalization of externalities, which is recognized as a social cost in economic terms, and as a crucial driver for corporate sustainability. In this chapter, the author examines a wide range of policies and efforts of the Korean government designing to promote corporate sustainability, and analyzes the 'State-of-the-Art,'of Korea, Korean industry, and key firms that are objects of the case study in the dissertation, in triple bottom line perspectives.

In the case of the Korean government's policies, this dissertation focuses mainly on policies of the Presidential commission on Sustainable Development (PCSD), the Ministry of commerce, Industry and Energy (MOCIE), and the Ministry of Environment (MOE). The policies of these three departments are directly connected with a firm's behaviors.

For analyzing the 'State-of-the-Art,' of Korea, this dissertation uses a wide range of information evaluated by international organizations. For Korean industry, it relies on the statistical data from domestic and foreign organizations. For the 'State-of-the-Art,' of Korean companies, the objects of the case study of this dissertation, the author will carry out literature reviews on the basis of sustainability reports and relevant websites. In addition, in order to understand TBL activities of key Korean firms, it compares them with that of globally leading companies in the same sectors. In addition, when analyzing TBL activities of key firms, a PDCA perspective is used. Even though it is a qualitative framework approach, it is highly useful for discussing and understanding the dynamic 'State-of-the-Art,' of strategic management.

On the basis of this analysis, this dissertation also provides insight related to the influence of Korean governmental policies on the behavior of Korean business circles, and the overall characteristics of the differences between leading Korean companies and leading global companies in PDCA perspectives (see Figure 3.1).

Figure 3.1 Structure of this Chapter linked with Driving Forces, Responses, and Status



3.2 Key Policies of Korean government for Sustainable Industry[46]

In the last three decades, the economy of the Republic of Korea has experienced unprecedented growth. However, a high population density and intensive industrial activity have continuously made environmental pollution worse. Human population concentration in certain regions has been an especially serious problem in Korea. For example, according to the national statistics office, the metropolitan area in Korea is 11.8% of the gross area of Korea but it has 46.7% of the total population, 57% of the manufacturing industry and over 80% of the national administrations.

In addition, the sharp increase of the number of elderly individuals in the population may lead to a weakening of the sustainability of Korean society. In the process of democratization, the conflict in Korean society has been more and more serious among various ranges of stakeholders from an economic point of view. Until now, a consensus that could strengthen Korean society has not yet been achieved.

In this respect, environmental issues have been in focus in Korean business circles, particularly in the context of finding ways for enhancing the level of Korea society in sustainability perspectives. In addition, UNEP emphasized environmental soundness for human-beings' sustainability[47] in the summit held in Rio in 1992.

Accordingly, various policies and measures of the Korean government for sustainable industry have focused on harmonizing the environment with the economy, in a distinct move away from policies that take economic growth and environmental conservation as contradictory. The three core bodies regarding sustainability in Korea are the Presidential Commission on Sustainable Development (PCSD), the Ministry of Environment (MOE), the Ministry of Commerce, Industry and Energy (MOCIE). Additionally, the Ministry of Labor (MOLAB), the Ministry of Construction & Transportation (MOCT), the Ministry of Health and Welfare (MOHW), and the Ministry of Agriculture and Forestry (MAF).have also addressed sustainable industry. However, their relevance to sustainable industry in contrast with the three core governmental agencies is less, although their activities tend to act in harmony with the policies of the three other government ministries. Accordingly, this dissertation mainly examines policies for sustainable industry of three core governmental agencies.

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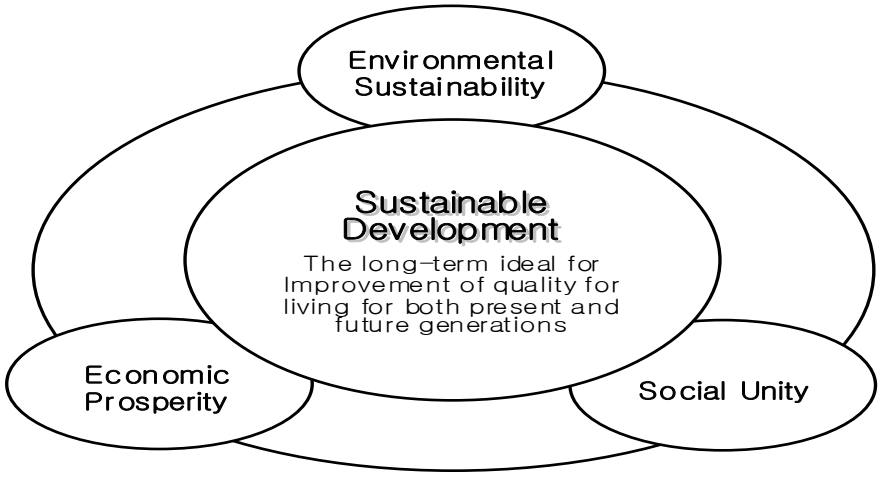
[46]Industry whose activities are sustainable by maximizing productivity simultaneously by minimizing the usage of natural resources and environmental pollution in the whole life cycle of the industrial activities to maintain or enhance the quality of life of the present and future generations.' 'Sustainable industry can be reached by means of two approaches. One is to accomplish the sustainability of industry through enhancing eco-efficiency, and the other is to change the industrial structure to be more sustainable. The former is a short-term approach, and the latter is a medium- and long- term approach (B.W. Lee and G.C. Kim, 2000).' The concept of 'sustainable industry' originated in Chapter 30 of 'Agenda 21', titled 'strengthening the role of business and industry'. It emphasizes promoting cleaner production and responsible entrepreneurship as two main roles of business.

[47]The crucial factor of sustainability has been changed according to the times (See Figure 1.1 of Chapter1). The concept of sustainability or sustainable development is shown in Section 4.3.2 of Chapter 4.

Even though **PCSD** is the leading organization for promoting sustainable industry in Korea, it was only established on June 5, 2000 in commemoration of World Environment Day. As a result, it did not have any influence on Korean business circles in sustainability perspectives before 2000. Furthermore, because it is a commission for providing consultation to the President on matters related to sustainability, no actual policy for sustainable industry has yet been prepared by them. It has primarily provided the directions and plans for sustainable development that coordinate economic, social and environmental concerns. The direction and planning activities are highly related to the activities of MOCIE and MOE. The following are purpose and the main activities of PCSD;

- The Purpose: To provide advice to the President on matters related to the sustainable and environmentally sound development of the nation, as well as the national solution of societal conflicts.
- The Direction:
  - National Strategy for Sustainable Development:
    - Developing basic plans by sector, such as water, energy and lands;
    - Sustainability assessment of the central and logistical governments;
  - Ensuring Sustainability in National Policies:
    - Directing each commission or agency to build plans based on the principles of sustainable development;
    - Ensuring sustainability of the nation's major mid- and long- term plans that are subject to prior assessment by the Commission;
  - Conflict Advisory and Management System in Governance of Sustainable Development:
    - Developing a conflict management system that will lead to the institutionalization of conflict prevention and resolution in environmental issues;
    - Providing advice for on-going conflicts that require additional inputs, including suggestions for resolving issues.

Figure 3.2 PCSD's Ideal Framework of Sustainability for Korean Society



Source: PCSD Brochure (2004)

- 5 Major Activities:
  - Sustainable Energy Policy:
    · Establishing basic plans for energy policy;
    · Institutionalizing public discussion systems to achieve a widespread support for energy policies from citizens;
  - Sustainable Water Management Policy:
    · Establishing basic plans for sustainable water policy;
    · Achieving economic soundness, social acceptance, and ecological health for water use and management;
  - Sustainable Land and Nature Management Policy:
    · Establishing basic plans for sustainable land use and management;
    · Building a foundation for bio-diversity preservation and sustainable use of natural resources;
  - Implementing the World's Key Action Plans for Sustainable Development:
    · Developing National Strategies for Sustainable Development (Including plans for implementing the WSSD Action items, followed by a scheme of evaluation);
    · Evaluating the National Strategy for Sustainable Development;
  - Developing a Conflict Prevention and Resolution System:
    · Developing and facilitating sound policy measures for the establishment of the Conflict Management System;
    · Providing formal advice and making recommendations for on-going national conflicts.

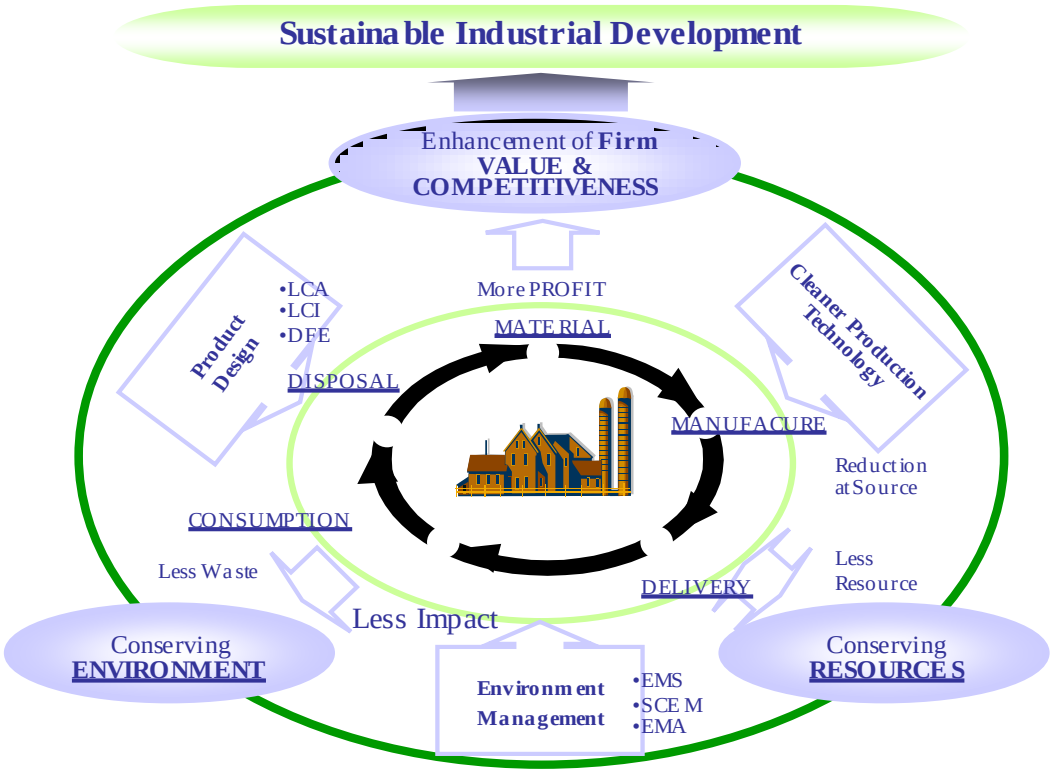
The Ministry of Commerce, Industry and Energy (MOCIE), which is responsible for the real economy, or more specifically the industrial sector, and the energy and resources sector, and finally the commercial sector, has tried to integrate environmental concerns into these kinds of sectors, for national sustainability. Korea's industrial environment policy was based on '*The Promotion Act for Conversion to Environmentally-friendly Industrial Structures*,' enacted in December 1995 by MOCIE. Its purposes are not only to encourage environmental management in Korean business circles through environmental management systems like ISO 14001 and cleaner production, but to improve eco-efficiency continuously. In addition, it provides funding to install and revise production processes allowing for environmentally-friendly products. MOCIE has also established and implemented the '*Comprehensive Action Plan for Environmentally-friendly Industrial Development*' from 1996 based on this law. The main action programs are reinforcing support systems, developing and diffusing cleaner production technology, enhancing environmental industry, and promotion of environmental management. Based on the CAP, MOCIE established the Korea National Cleaner Production Center (KNCPC) under the Korea Institute of Industrial Technology (KITECH) in 1999. KNCPC has tried to achieve sustainable development through cleaner production (hereafter, 'CP')[48]. Its activities for sustainable industries are to:

[48] In accordance with the definition of CP developed by UNEP, KNCPC is defined as the following: CP continuous application of an integrated preventive environment strategy to process, products, and services to increase overall efficiency, and reduce risks to humans and the environment. CP can be applied to the process used in any industry, to products themselves and to various services provided in society.

- Develop sustainable industrial development policies by taking the role of innovative technological agencies for the Industrial Environment Division of MOCIE.
- Assist companies to establish cleaner production infrastructure by process assessment, training, providing cleaner production technology development funds, and disseminating the development results (e.g. Remanufacturing, Sustainable Product, Cleaner Production Assessment, Eco-Design, LCA/LCI)
- Develop a medium to long term environment-friendly business strategies and plans for diverse industrial sectors to increase their global competitiveness by taking proactive measures to comply with international environmental laws and regulations (e.g. Supply Chain Environment Management, Eco Industrial Park etc).
- Form a global network by international cooperation through the UNIDO/UNEP CP Program as well as by forming partnerships with environmental institutions in the EU, US, and Japan

In connection with developing and diffusing cleaner production technology, NCCP provided about USD 170 million dollars to more than 1,320 cleaner production technology development projects from 1995 to 2003.

Figure 3.3 Conceptual Diagram of Cleaner Production for Sustainable Development



Source: http://www.kncpc.re.kr

At the same time, recognizing that the conservation of energy and reduction of greenhouse gases not only contributes to international cooperation but are also consistent with the long-term development goals of the Korean economy, MOCIE, in collaboration with other governmental departments including MOE has established measures related to energy conservation and reduction of greenhouse gas

emissions as advocated by the UN Framework Convention on Climate Change (UNFCCC). In 2001, the agreement on the implementation plan for the Kyoto Protocol and changes in Korea's economic and industrial circumstances were reflected in the establishment of *the Second Comprehensive Action Plan* (2002~2004). Through the Plan, efforts are being made nationwide to accelerate the steering of business activities to low energy-consuming industries and to conserve energy for the prevention of global warming.

Accelerated development of advanced industries that are less energy-intensive such as the IT industry and other high-tech industries and active energy conservation efforts in all sectors will enable the early establishment of an economic structure that prioritizes energy conservation. This reflects Korea's basic policy direction and measures for greenhouse gas reduction in order to contribute to the global efforts to mitigate climate change. MOCIE announced 'Energy Vision 2030' in 2006 including a policy to also promote production and use of all forms of renewable energy as a part of its total energy balance.

The reduction of greenhouse gases in the energy sector is being promoted by targeting energy supply and demand, heating and cooling of buildings, and transportation fuel. As regards energy demand, greenhouse gas reduction is being achieved through an integrally managed energy conservation policy and improvements in energy efficiency. For energy supply, policies are being devised to expand the use of renewable and cleaner energy. Furthermore, various policies and measures to improve energy efficiency in buildings, expand the use of clean fuel, and broaden the market demand for compact cars are also being formulated. In the transportation sector, various greenhouse gas reducing efforts are being made through two promotional goals: (1) efficient management of the national transportation system and traffic demand and (2) establishment of a comprehensive logistics information network and standardization of the logistics apparatus. Greenhouse gas reduction efforts are also being made in the agriculture & livestock sectors by improving farming and animal husbandry methods. As for the waste sector, policies and measures to establish a foundation to minimize waste, increase recycling and expand waste management processes are being implemented. Policies to increase removal and decrease of emissions are also being implemented in the forestry sector through efficient management and maintenance of forests and re-forestation (www.mocie.go.kr). Above these, MOCIE has made a great effort to promote environmental management in collaboration with industrial organizations such as KCCI (Korea Chamber of Commerce and Industry), and endeavors to develop and diffuse environmental management tools recently.

The Ministry of Environment (MOE), which is responsible for protecting national territory from threats of environmental pollution and improving the quality of life for the public so that the people can enjoy high quality ambient natural environment, clean water and clear skies. Consequently it is pursuing environmental policies that can create a win-win system between the environment and economy for enhancing environmental sustainability of Korea. Article 40 of the Government Organization Act which

provides the mandate for the Ministry of Environment to be responsible for works related to the protection of natural and ambient environment and the prevention of environmental pollution has tightened up since 2000. In particular, it is working to properly manage hazardous chemicals, which can affect the human body through various channels, in order to protect public health and ecosystems. In addition, MOE has introduced economic based tools and an implementation framework for strengthening partnerships with various sectors and levels of society. Environmental education in schools, as well as society at large, is being promoted to raise citizen awareness on environmental conservation for the achievement of sustainable industry (www.moe.go.kr).

MOE's policies for sustainable industry are based on "Development and Promotion of Environmental Technology" enacted in 1994, the "Environmental Friendly Company Designation System (EFCDS)" established in 1995, and "Environmental Declaration of Products (EDP) Program" established in 1992(Type Ⅰ), 2001(Type Ⅲ). The Korean government gives priority to a successful implementation of environmental policies seeking to establish a sound market for environmental industry while promoting an environmentally friendly business cycle.

The Environmentally Friendly Company Designation System, for fostering sound environmental management and promoting preventive solutions to environmental pollution that arises during the manufacture processing, awarded 137 companies this certificate by 2003. Through the System, the Corporate Environmental Information Disclosure System in companies, with an array of activities being undertaken to realize environmentally-friendly production and consumption patterns as well as construction schemes, and the Environmentally Friendly Company Network, for promoting exemplary cases of outstanding sustainable business performances, were established. The Business Environmental Report Guideline continuously assists corporations in carrying out environmentally friendly management, while the products of Eco-Labeling were gradually expanded, reaching 577 kinds of products by June 2003. In addition, 16 product categories and 130 products have been certified by the Environmental Declaration of Products (EDP) Program, which measures environmental impacts of a product throughout its lifecycle. In addition, the number of companies, which produce an environmental, social, or environmental report, has increased to about 60 from every sector since 1999.

In concert with the world-wide trend the environmentally-friendly products and management structure of corporations are becoming overriding determinants of their competitiveness, the wide range of industrial environmental measures enforced by Korean governments such as MOCIE, MOE have significantly influenced the behavior of Korean business circles(see Table 3.1). Particularly, globally leading companies in Korea have endeavored to raise their real corporate value through increased sales, cost reductions and investment efficiency via environmental management. The effects of industrial policies by Korean governments can be summarized as follows:

Table 3.1 Impacts of Policies for Sustainable Industry on the industrial sectors

	Policies and Measures	Characteristics	Impact on Industrial sectors
PCSD	・Sustainable Energy Policy ・Sustainable Water Management Policy ・Sustainable Land and Nature Management Policy ・Implementing the World's Key Action Plans for Sustainable Development ・Developing a Conflict Prevention and Resolution System	・Direction for Policies and Measures of Governments for Sustainable Development	・Indirect
MOCIE	・Environmental Management ・Environmental Management System ・Supply Chain Environmental Management ・Cleaner Production ・Energy and Climate Change Policy (e.g. ESCO)	・Voluntary Approach with incentives e.g. tax etc.	・Direct ・Not yet. Energy-intensive companies
MOE	・Economic Incentive Tools in Acts ・Environmental Friendly Company Designation System ・LCA and Eco-Design ・Environmental Declaration of Products ・Environmental Information Open (e.g. Environmental Report)	・Mandatory ・Voluntary Approach with incentives e.g. tax etc.	・Direct ・Direct, particularly, pollutive industries

3.3 'State-of-the-Art,' of Korean Industry from a sustainability perspective

3.3.1 'State-of-the-Art,' of Korea from the TBL perspective

Several indicators reveal the disparity among different sectors in Korean society. The Gross National Income (GNI) in Korea lies in the range of 12th or 13th in the world and income per capita lies in the range of 54th in the world. But, Korea is ranked 122nd in the world in environmental sustainability out of 146 countries according to the latest (2005) Environmental Sustainability Index (ESI)[49] reported in WEF (World Economic Forum). It ranked 161st in the world out of 180 in Ecosystem Wellbeing Index (EWI) by The World Conservation Union (IUCN) and Canada's International Development Research Center (IDRC)[50]. However, it ranked 27th in the world out of 180 in Human Well Being Index (HWI).

[49] It benchmarks the ability of nations to protect the environment over the next several decades, produced by a team of environmental experts at Yale and Columbia Universities in 2001. In the meanwhile, Korea ranked 15 in the OECD members out of 23 countries in Environmental Performance Index (Measure of the performance of environmental policies)

[50] Well Being Assessment is a method of assessing sustainability that gives people and the ecosystem equal weight and provides a systematic and transparent way of:
· deciding the main features of human and ecosystem Well Being to be measured;
· choosing the most representative indicators of those features; and
· combining indicators into a Human Well Being Index (HWI), Ecosystem Well Being Index (EWI), Well Being Index (WI), and Well Being/Stress Index (WSI, the ratio of human Well Being to ecosystem stress). Together, these four indices provide a measurement of sustainable development.
It was developed and tested with the support of IUCN–The World Conservation Union and the International Development Research Centre (IDRC). The HWI (Human Well Being Index) is a more realistic measure of

We see, according to these results, that economic and social development have been improved but the eco-system has been heavily damaged and continues to deteriorate under great pressure from socio-economic growth. The following paragraphs discuss, in detail, the ‘‘State-of-the-Art,’’ of sustainability in Korea on the basis of key sustainability indicators measured by international organization.

First, based upon economic and industrial indicators, gross domestic production in Korea reached its peak, US520bil$ in 1996 just before the foreign exchange crisis, when it went down sharply to US318bil$ in 1998, and then back up to US462bil$ in 2000, to US427bil$ in 2001, and to US477bil$ in 2002. This reflects that Korea is recovering from the shock in 1997, but the scale of GDP in 2002 was lower than that of in 1996. Income per capita in 1996 was at US 11,385$, but it went down sharply to US 6,744$ in 1988, to US 9,770$ in 2000, to US 9,000$ in 2001, and to US 10,013$ in 2002. The rate of savings, the key indicator for the forecast of future economic activity, has also decreased from a peak of 37.5% in 1998, to 35.3% in 1999, 33.7% in 2000, 31.7% in 2001, 31.3% in 2002, 32.8% in 2003, and 33.0% in 2004(Bank of Korea, 2006).

The Gross Domestic Investment Ratio was maintained at over 35% during the 1990s; however, it went down sharply below 30% after 1998. The rapid increase of the amount paid for credit card debt has led to an increase of the debt rate in households, and this increasing rate of debt of approximately 24% yearly, is becoming a major economic issue to be solved from an economic sustainability perspective. Financial assets in households, exclusive of debt, were 133.4% based on disposable income in 2002, which was less than half the level of G-7 countries. This means that most of the debt in households is attributed to consumption and to housing purchases. The number of people owning automobiles has increased 4.7 times from 3.1 million in 1998 to 14.6 million in 2001. Approximately 46% of the total vehicles, excluding two-wheeled vehicles, were used within the centralized Metropolitan area including Seoul (20% only in Seoul).

From another social indicator perspective, poverty has become the most important issue in Korea. The number of needy people in Korea is 1.5milion, 3% of the population based on being recipients of the National Basic Livelihood Security System (NBLSS) in 2002. The ratio has decreased compared with 5% in the early 1990s. However, the disparity between the rich and the poor, that is to say, the gap of gross income between the first decile and the tenth decile has increased. Therefore, the conflict between social classes has become worse. The aging population is another key issue in Korea. The population over 65 year was 8.3% in 2003, but according to forecasts, it will increase to 15.1% by 2020,

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socioeconomic conditions than narrowly monetary indicators such as the Gross Domestic Product and covers more aspects of human Well being than the United Nations’ Human Development Index. It is the average of Health and population, Wealth, Knowledge and culture, Community, Equity. The EWI(Ecosystem Well Being Index) is an equally broad measure of the state of the environment, with a fuller and more systematic treatment of national environmental conditions than other global indices such as the Ecological Footprint and the Environmental Sustainability Index. It is the average of Land, Water, Air, Species and genes, Resource use.,

and to 20.0% by 2026. OECD has forecasted that Korea will experience a sharp increase in need for a sustenance allowance because of this aging population[51]. Population aging will lead to a slowdown in labor force growth and within 20 to 30 years the labor force may even begin to contract. As a result, a decrease of savings ratio, an increase of social security costs, and a decline in labor productivity are anticipated.

The equality between males and females should be improved in Korea. The percentage of females among public service personnel is 32.8%, but the percentage of high graded female officials (generally, over fourth grade) was no higher than 2.4% in 2001. Korea was ranked 61st in a gender empowerment index out of 66 countries in the 2002 Human Development Report published by United Nations Development Programs (UNDP).

Further bases for comparison are indicators which measure environmental pollutants in Korea. First the situation of Greenhouse Gases (GHG) emissions presents a serious problem. The rapid increase of energy consumption has led to massive GHGs emissions. The amount of GHG emissions has increased from 81million TC (ton of carbon) in 1990 to 134milion TC in 2000, showing a rise of approximately 66.5% in 10 years. This rate of increase was the highest in the world during that time. The Korean Energy and Economy Institute (KEEI) forecasted that, even now, the pace of GHG emissions continues to increase, therefore, GHG emissions per capita in Korea will be above average GHG emissions for of OECD countries within 10 years.

The deterioration of air quality in Korea from aggressive industrial activities and the soaring number of vehicles on the road during its period of unprecedented economic and social growth is a very serious problem. In particular, air-related risks such as smog in major cities and serious health concerns including respiratory problems and early death requires that immediate action must be taken. The pollution levels of sulfur dioxide (SO_2) in every city in Korea has already met the recommended standard of WHO (0.019ppm) in 2001. At that time, the levels in Ulsan, which was the most serious in Korea, recorded at 0.012ppm. However, massive increases in numbers of vehicles on the road have caused serious air contamination. In particular, the pollution levels of nitrogen dioxide (NO_2) in Seoul was very high (0.037ppm on average for a year) due to the increasing number of vehicles, which was by far in excess of the recommendation criterion of WHO(0.02ppm). Fortunately, ozone concentrations above Korea have been improving recently. According to data by the Korean Ministry of Environment (MOE), the ozone concentration over the Korea peninsula has steadily decreased by 3.8~4.9% yearly. The pollution level by specific region and time is more serious. In result, air quality in Korea ranked 72nd in the world out of 122 countries according to the Environmental Sustainability Index reported in 2001 WEF.

[51] OECD, *Ageing and Employment Policies in Korea – the challenge of an ageing population*, 10, Nov. 2004

Water quality in Korea has been steadily improved from 1993-2002 due to implementation of the *Comprehensive Measures on the Provision of Clean Water* by MOE in 1993. Only 29.4% of 194 rivers in Korea were suitable for drinking water (more than 3rd grade) in accordance with the water quality standard in 1993, and the percentage was doubled in 10 years. Moreover, non-point source pollution such as run-off from agricultural fields, forests, and roads has become highlighted as a major area of concern. The quality of half of the 498 surface waters for water supply only reaches the 1st grade. Water quality level in the four major rivers, Han-gang, Nakdong-gang, Geum-gang, and Yeongsan-gang, has greatly improved since 1997; however, Yeongsan-gang has remained within the scope of 3rd~4th grade for a long time[52].

In Korea, the potential water resource volume is about 127 bil ㎥ on the basis of an average annual precipitation of about 1,283㎜. However, 54.5 bil ㎥ or 43% of it is lost in the form of infiltration and evaporation and the remainder, about 73.1 bil ㎥ or 57% is estimated to be annual surface runoff. Of this amount, 49.3 bil ㎥ is swept away by floods immediately, the remaining amount of water, 23.8 bil ㎥ flows during normal periods. At the end of 2001, the water supply was 33.8 bil ㎥ per year, higher than the demand of 33.7 bil ㎥, with about 0.1 bil ㎥ left over. Due to rapid industrialization in Korea, water demand has increased by an average of 1.6% a year until recently. However, the rate of increase is expected to slow down because groundwater development costs a great deal and can cause environmental damage as well as the pollution of groundwater[53]. Currently, Korea has two core issues regarding water resources. The first is that water resources are not sufficient to meet the demand, and second is that water use efficiency has become worse due to the low cost for using water.

Korea's amount of waste generation per unit area is one of the highest among OECD member countries. As the amount of waste generation increases along with the development of industry and improvement of living standards, securing incineration and landfill facilities is becoming more difficult with the NIMBY syndrome. Since 1993 the total amount of waste generation has steadily increased.

[52] Korean MOE has 5 categories in accordance with the criteria of BOD, COD, DO etc as followings;

Grade Level	pH level	BOD(COD)	Suspended Solids	Dissolved Oxygen	Coliform Count	Total Phosphorous	Total Nitrogen
1	6.5~8.5	Below 1 (1)	Below 25 (1)	Above 7.5	Below 50	Below 0.01	Below 0.2
2	6.5~8.5	Below 3(3)	Below 25 (5)	Above 5	Below 1,000	Below 0.03	Below 0.4
3	6.5~8.5	Below 6 (6)	Below 25(15)	Above 5	Below 5,000	Below 0.05	Below 0.6
4	6.5~8.5	Below 8 (8)	Below100(15)	Above 2	-	Below 0.10	Below 1.0
5	6.5~8.5	10 (Below 10)	No floating trash	Above 2	-	Below 0.15	Below 1.5

Note: 1) Unit: mg/L for all except Colon Bacilli, MPN/100ml; 2) BOD: indicator for streams, COD: indicator for lakes and marshes; 3) ( ) and T-P, T-N apply to lakes and marshes

[53] http//www.kowaco.or.kr

Korea's household waste materials from everyday life and economic activities have substantially decreased after the introduction of *the Volume-based Waste Fee System* (unit pricing system) in 1995. However, the total amount of waste generation has gradually increased again since 1999. Household wastes steadily decreased from 63,000 ton/day in 1993 to 48,400 ton/day in 2001, but, industrial wastes have dramatically increased from 78,500ton/day in 1993 to 212,000 ton/day in 2001. The amount of organic wastes, which are thrown into the east and west sea of Korea, has sharply increased from 2,446,000ton/year to 7,671,000 ton/year. On the whole, the rapid increase of the generation of wastes and environmental expenditure for treatment of wastes has increased, and therefore social conflicts according to disposal of wastes has become more and more serious in Korean society

3.3.2 'State-of-the-Art,' of Korean Industry from a sustainability perspective

This dissertation examines the 'State-of-the-Art,' of Korean industry from a sustainability perspective through a literature review. The main literature sources are a research report by POSRI (2003) and a paper by Lee and Kim (2002). On the basis of both research studies, key indicators for evaluating sustainable industry were designed to assess the status of industrial sustainability. Eleven indicators from three categories of natural resources, socio-economy and the environment, were selected as follows:

Table 3.2 Indicators for Evaluating Sustainable Industry

Aspect	Indicators
Natural Resources	·energy consumption ·water consumption ·wastes
Socio-economy	·contribution to economic growth ·value-added rate ·employment ·ordinary margin*
Environment	·air pollution ·waste water ·wastes recycling rate ·carbon dioxide emission

Note: * = ordinary income/sales∗100. Its purpose is to identify that profit change is caused by the change of sales margin or sales.
Source: POSRI (2003), Lee and Kim (2002).

1) Natural Resources

Energy Consumption

Energy consumption of industry decreased to 0.14 (TOE[54] / million KRW[55] at 1995 prices) in 1985

[54] Ton of Oil Equivalent
[55] Korea Republic Won (as of 2006. 10. October, 1EUR = 1,209.26KRW)

from 0.18 in 1990. But since then it has gradually increased to 0.19 in 2000, which is slightly higher than the level in 1980. Meanwhile, energy consumption of manufacturing in 1990 decreased by 20% from 1981, but it increased again to 0.51 (about 13.7%) in 1999 from 0.44 in 1990. High growth in energy intensive manufacturing results in the increase of energy consumption in the 1990s.

Table 3.3 Energy Consumption in Industry and Manufacturing

(Unit: TOE / Million KRW at 1995 prices)

	1980	1985	1990	1995	2000
Industry total	0.18	0.14	0.16	0.18	0.19
Manufacturing	0.57*	0.44	0.44	0.51	0.51**

Note: * Statistics in 1981; ** Statistics in 1999
Sources: Bank of Korea, Korea Energy Economics Institute

Water Consumption

Water consumption of manufacturing increased to 32.44 (ton / million KRW at 1995 prices) in 1990 from 27.47 in 1980. Since then it decreased remarkably to 24.84 in 1998 through big investments in water saving facilities and recycling.

Table 3.4 Water Consumption in Manufacturing

(Unit: Ton / Million KRW at 1995 prices)

1980	1990	1994	1996	1998
27.47	32.44	26.10	27.04	24.84

Sources: Bank of Korea, Ministry of Environment

Wastes

Wastes from manufacturing, based on the sum of general industrial wastes and specified wastes, continuously increased from 0.092 (ton / million won at 1995 prices) in 1990, to 0.156 in 1998, mainly due to the increase of general industrial wastes. The growth rate, however, slowed down in the late 1990s.

Table 3.5 Wastes in Manufacturing

(Unit: Ton / Million KRW at 1995 prices)

1990	1995	1996	1997	1998	1999
0.092	0.106	0.130	0.138	0.145	0.156

Sources: Bank of Korea, Ministry of Environment

2) Socio-economy

Contribution to Economic Growth

The contribution ratio of domestic industry to economic growth – the ratio of amount increased GDP

by economic activity – is more than 90%. This means that the economic growth was mainly due to business activities, not by households or government. The contribution rate of manufacturing more than doubled to 56.3% in 2000 from 23.1% in 1985, and manufacturing has pulled domestic economic growth since the mid-1980s.

Table 3.6 Contribution Percentage to Economic Growth by Sector (%)

	1980	1985	1990	1995	2000
Industry Sectors	122.4	97.0	94.8	99.8	96.8
Agricultures, forestry and fishery	147.7	8.9	-5.9	4.7	0.1
Mining	3.7	0.8	-0.3	0.0	0.1
Manufacturing industry	9.3	23.1	28.7	36.3	56.3
Electricity, gas and water service	-8.4	2.5	3.3	1.8	3.5
Construction	15.8	6.6	28.2	11.1	-3.7
Others	-45.6	55.1	40.8	45.9	40.5

Source: Bank of Korea

Value-added Rate

In regard to value-added by sector, mining, electricity and communication are all more than 40%. Manufacturing kept 25% level until the mid-1990s, but began to decrease and reached 20.3% in 2000. Increased raw material prices and decreased labor costs owing to corporate restructuring lowered the value-added rate of manufacturing.

Table 3.7 Value-added Rate in Different Industrial Sectors (%)

Industry Sectors	1991	1993	1995	1997	1999	2000
Mining	35.2	34.8	41.2	50.7	42.8	47.9
Manufacturing industry	25.8	26.1	26.4	21.9	23.5	20.3
Electricity and gas	53.4	49.6	47.4	37.6	47.9	44.6
Construction	37.0	35.1	32.3	27.1	22.1	22.9
Communication*	55.5	50.0	50.8	41.9	49.5	44.3

Note: * includes transportation and warehouse before 1997
Source: Bank of Korea

Employment

Employment in agriculture (including forestry and fishery) occupied more than a third of the total employment until 1980, but the share of agriculture sharply decreased to 10% recently. In contrast, employment in construction and other service industries substantially increased.

In the case of manufacturing, the share remained at more than 20% level for the period, albeit there were small fluctuations. Since 1990 it decreased slightly to 20%, which suggests that the competitiveness of labor-intensive industry is beginning to deteriorate.

Table 3.8 Employment

(Unit: Thousand, %)

	1980	1985	1990	1995	2000
Total	13,683 (100)	14,970 (100)	18,085 (100)	20,432 (100)	21,061 (100)
Agricultures, forestry and fishery	4,654 (34.0)	3,733 (24.9)	3,237 (17.9)	2,534 (12.4)	2,288 (10.9)
Mining	124 (0.9)	155 (1.0)	79 (0.4)	27 (0.1)	18 (0.1)
Manufacturing	2,955 (21.6)	3,504 (23.4)	4,911 (27.2)	4,797 (23.5)	4,244 (20.2)
Electricity, gas and water service	44 (0.3)	41 (0.3)	70 (0.4)	70 (0.3)	63 (0.3)
Construction	843 (6.2)	911 (6.1)	1,346 (7.4)	1,905 (9.3)	1,583 (7.5)
Others	5,063 (37.9)	6,626 (44.3)	8,442 (46.7)	11,099 (54.3)	12,865 (61.1)

Source: National Statistical Office

Ordinary margins of electricity and gas are highest at 12.3% and communication stands next by 8.5%. Manufacturing, on the other hand, is very low at 1.3%. The ordinary margin of manufacturing increased rapidly from 2.3% in 1990 to 3.6% in 1995, but recorded negative figures in 1998 during the depression.

Table 3.9 Ordinary Margins by Industrial Sector (%)

	1990	1992	1994	1996	1998	2000
Mining	-3.8	-9.3	15.2	-16.0	-27.1	-1.9
Manufacturing	2.3	1.5	2.7	1.0	-1.8	1.3
Electricity, gas and steam	-	-	-	-	9.5	12.3
Construction	-	-	-	-	-4.6	-3.9
Communication	5.1	5.6	6.0	1.7	6.6	8.5
Real Estate	21.9	31.7	-0.7	-3.5	13.2	2.0
Business Service	4.5	1.9	3.4	2.3	3.4	5.2

Source: Bank of Korea

Operating profit to net sales of manufacturing, compared with other countries, was not lower than others, though the ordinary margin was fairly low. This is because the financial cost burden was relatively high.

Table 3.10 International Comparison on Manufacturing's Profitability (%)

	Korea(1999)	U.S.A(1998)	Japan(1998)	Germany(1996)
Operating profit	6.6	7.5	2.5	-
Ordinary margin	1.7	8.1	2.3	1.8
Financial cost rate	6.9	2.0	0.9	1.2

Source: Bank of Korea

3) Environment

Air Pollution

Air pollution units caused by industry were reduced by 53.3% to 6.88 (ton / billion won at 1995 prices) in 1999 from 14.73 in 1991. Sulfur dioxide emission units were decreased by 67.4% from 9.71 to 3.17 mainly due to the low-sulfur oil supply policy in the same period, led to the reduction of air pollution by industry.

Table 3.11 Air Pollution Unit in Industry Sector

(Unit: Ton / Billion won at 1995 prices)

	SO_2	NO_2	TSP	CO	HC	sum
1991	9.71	2.73	2.00	0.26	0.02	14.73
1993	8.88	3.21	1.65	0.18	0.02	13.93
1995	6.61	3.11	1.42	0.15	0.02	11.32
1997	4.90	3.00	1.25	0.15	0.02	9.32
1998	3.99	3.02	1.28	0.14	0.02	8.45
1999	3.17	2.51	1.06	0.12	0.02	6.88

Sources: Bank of Korea, Ministry of Environment

Waste Water

Waste water units, just fluctuating near 2.5 (m^3 / million won at 1995 prices) in late 1990s, did not show a meaningful change.

Table 3.12 Waste Water Unit in Industry Sector

(Unit: m^3 / million won at 1995 prices)

1995	1996	1997	1998
2.52	2.49	2.45	2.61

Sources: Bank of Korea, Ministry of Environment

Wastes Recycling Rate

While the recycling rate of general industrial wastes was more than 60% all through the 1990s, and increased to 73.6% in 1999, the recycling rate of specified wastes fluctuated near 50% in the 1990s. Average weighted wastes recycling rate increased to 72.6% in 1999 from 60.7% in 1994.

Table 3.13 Wastes Recycling Rate in Manufacturing (%)

	1994	1995	1996	1997	1998	1999
General Industrial Wastes	61.3	61.5	66.3	64.4	66.6	73.6
Specified Wastes	48.8	48.2	46.4	51.2	53.6	50.2
Weighted Average	60.7	60.9	65.5	63.8	66.1	72.6

Source: Ministry of Environment

Carbon Dioxide Emission

If the carbon dioxide emission units of manufacturing via emission amount from industrial fuel combustion and industrial processes are calculated, it is shown that it continuously increased to 0.48 (ton / million won at 1995 prices) in 1995 from 0.43 in 1985, but decreased to 0.46 in 1998.

Table 3.14 Carbon Dioxide Emission Unit in Manufacturing

(Ton / Million won at 1995 prices)

1985	1990	1995	1998
0.43	0.45	0.48	0.46

Sources: Bank of Korea, Ministry of Environment

4) Industrial structure and efforts

As a result of industrial responses to a wide range of industrial policies in light of changes in industrial structure, even though it is very difficult to relate every business change to these policies, the ratio of value-added in eleven highly polluting manufacturing industrial sectors (dyeing, leather, paper, petrochemical, cement, iron and steel, non-ferrous metal, casting, plating, electronics and automobile) to that of all manufacturing, increased from 67.2% in 1985 to 72.2% in 1999. This result is comparable with most advanced countries, whose percentages decreased in the same period (B.W. Lee and G.C. Kim, 2000).

Table 3.15 Value-added and Employment Percentage of Highly Pollutive Manufacturing Industries

	Value-added Percentage (%)		Employment Percentage (%)	
	1985	1999	1985	1999
Korea	67.2	72.2	65.2	63.2
Japan	60.9	56.3	57.1	51.5
U.S.A	56.5	54.1	55.8	48.9
Great Britain	55.8	50.2	56.6	51.2
Netherlands	54.5	49.0	56.2	53.3

Source: UNIDO, *Country Industrial Statistics*, 2003.

The industrial structure of a country will be changed by various and complex factors such as economic conditions, technology, final consumption, industrial policy and change of a corporation's business portfolio. Therefore, it is difficult to explain industrial structure changes by means of government policy only. Nevertheless, this result is implying that the policies or efforts of conversion to environmentally friendly industrial structure have had little influence on structure, even though its target does not reach a satisfactory level during the period (B.W. Lee and G.C. Kim, 2000).

In regard to introducing and diffusing environmental management systems, there was a rapid increase

in the number of companies certified ISO 14001 since enactment of The Promotion Act. As a result, Korea is ranked 10th in the number of ISO 14001 certified companies. At the end of December 2004, at least 90,569 ISO 14001 certificates were issued in 127 countries and economies. Korea was ranked 10th by the end of 2004 with 2,609 ISO 14001 certificates issued in 98 countries.

Table 3.16 Top Ten countries for ISO 14001 Certificates (As of end 2004)

Nation	Number	Nation	Number
Japan	19,584	USA	4,751
China	8,862	Germany	4,320
Spain	6,473	Sweden	3,478
United Kingdom	6,253	France	2,955
Italy	4,758	Korea, Rep. of	2,609

Source: ISO, *The ISO Survey of Certification-2004*

A number of corporations interested only in certificates of environmental management systems in the early stages prior to the end of 2000, shifted attention to development and introduction of various environmental management tools such as environmental performance evaluation, environmental accounting, and eco-design based on life cycle assessment. In particular, large companies, like POSCO, Hyundai Motors, Samsung Electronics, and SK have tried to expand their experience, environment friendly technologies, and know-how into their supplier and external partners through supply chain environmental management since 2003. They have also striven to regularly publish sustainability or environmental reports containing a wide range of sustainability/environmental or social activities.

Introducing environmental management systems and promoting cleaner production, however, are not sufficient to accomplish sustainable industry, so a more comprehensive policy is needed. The number of Korean firms certified for ISO 14001 has sharply increased since 1996. However, the Korean firms that publish environmental or sustainability reports regularly has only increased slowly. In the case of the former, at the end of 2004, the number is 2,609 according to ISO, but the number of sustainability reports is not more than 100 according to corporateregister.com, GRI. The number of sustainability reports is under 10 as of 2004. It implies that real change in industrial structure or management style in Korea is not enough for sustainable competitive advantage according to the change of external circumstances and internal organization.

In this respect, Korea's PCSD is preparing a 'National Sustainable Development Strategy' covering various sectors such as industry, energy, traffic, water resources, forest and agriculture. Beginning in the 3rd term of the Commission, it formulated the framework of the ideal of sustainability for Korean society and established its action plan including direction and five major activities. However, it also seemed to be an environmentally-oriented plan and overlooked real issues related to the industrial sector from a

triple bottom line perspective, more specifically sustainability in growth perspectives. *B.W. Lee and G.C. Kim (2000)* have also clarified that Korean policies and measures related to sustainable industry have been helpful to handle some environmental issues, but they are not sufficient and lack consideration for sustainability and the right direction of industrial policy should be more focused on sustainability since the industrial paradigm is changing.

3.3.3 *'State-of-the-Art,'* of key firms from a sustainability perspectives

This dissertation examines globally leading companies of Korean and foreign countries in the strategic framework for sustainability perspectives in this section. The Plan-Do-Check-Act approach (hereafter, PDCA) is applied for identifying the status of strategic management for sustainability. The primary reason that this author chose PDCA for checking efforts towards sustainability management is that corporate sustainability management aims to make a real continuous improvement towards corporate growth or perpetuity. Consequently, PDCA will be helpful to confirm and understand various ranges of activities for corporate sustainability clearly and accurately.

Table 3.17 Standpoints for the 'State-of-the-Art,' Review

		Corporate Activities from the point of Triple Bottom Line views
Plan	Stakeholder Analysis	·Identification of Core Stakeholders of Companies
	Business Principles	·Reflection of Laws, Regulations, and Standards etc. of External and Internal Society
	Management Philosophy	·Reflection of the concept of sustainability for continuous growth and its characteristics
	Objectives	·Objectives and Targets of Corporate Level
	Measures	·Indicators for diagnosing the progress of Objectives and Targets
Do	Awareness	·Activities for enhancing awareness of internal and external persons, e.g., PR, Training Departments
	Organization	·Organization in charge of Sustainability Issues
	Implementation	·Activities by Value Chain (R&D, Purchase, Manufacture, Marketing
Check	Self-diagnosis	·Whether company itself diagnosed or not, and irregularly or regularly
	Third Party Verification	·Verification of Management Systems like ISO 9000, ISO 14001, OHSAS 18000, SA 8000 etc. and Environmental, Social, and Sustainability Report ·Results of Rating Institutes like SAM, FTSE, ISVA etc.
Act	Board of Director	·Whether the review done regularly or not, and irregularly or regularly
	Management Review	·Whether the review or not, and irregularly or regularly
Consistency		·Linkage of PDCA loop

Together with the TBL perspective by item, this researcher analyzed activities in the PDCA context.

Consistency is highly important in strategic management for systematically and efficiently achieving their objectives.

Meanwhile, this dissertation mainly refers to the latest issue of environmental and sustainability reports published by each company, and reflects upon the results of interviews with key persons in charge of Sustainability Management of each company.

1) Korean Companies: Focusing on Samsung SDI, POSCO, Hyundai Motor

Many companies in Korea had an interest in environmental management since 1992, particularly in 1996, when the ISO 14001 standard was confirmed for the purpose of applying environmental management systems in the world. Therefore, Korean companies tried to introduce and receive ISO 14001 certificate from third parties and drive cleaner production for real performance. However, sustainability management is only in the initial stage. Accordingly, this dissertation analyzes the 'State-of-the-Art,' of sustainability management focusing on Samsung SDI (electronics industry), POSCO (steel industry), and Hyundai Motor (motor industry). They are the globally leading companies in their respective sectors, and recently, have been model companies to proactively promote sustainability management in Korea

① Samsung SDI

Samsung SDI has built a triangular business structure; the digital display business creating an ultra-large PDP and a prestigious CRT, the mobile display business for OLED and LCD, and the energy business dealing with rechargeable batteries each apex. It has 13 production bases in seven countries and runs sales offices in Los Angeles, the U.S and Hong Kong, China. Domestically the company is based in Seoul with nation-wide plants in Suwon, Busan and Cheonan, and the Corporate R&D Center is in Giheung. As of late 2004, 9,884 employees were working in domestic sites and 27,054 employees worldwide. (Samsung SDI, *Sustainability Report 2004*).

Management Philosophy

"We will devote our human resources and technology to create superior products and services, thereby contributing to a better global society." Samsung SDI, with a management philosophy of contribution to the human society, does its best to develop globally competitive people and create the best technologies and products that can lead digital/mobile display business, aiming at maximization of customer satisfaction. TDC (Technology Driven Company) is to be realized based on the best digital technology. Strongest competitiveness comes from creativity and sprit of challenge in the digital era. To build a new digital world beyond one's imagination, Samsung SDI never stops moving.

New Vision

Creating the future of Display & Energy; 'Create' means more than manufacturing products. It is to capture the needs that customers have yet to be aware of and to create products, offering convenience

and beauty to customers, and represents the TDC spirit of making continuous efforts to explore a new future. This can lead Samsung SDI to shape the future of display and energy businesses with cutting-edge technologies.

The background of Samsung SDI to drive sustainability management from 2003 consists of three factors:

- CEO's direction: Samsung Group has a lot of subsidiaries including Samsung SDI. It has monthly meetings attended by the presidents of all-companies (subsidiary) for deliberating solutions to a rapidly changing business atmosphere. The CEO of Samsung Group, Mr. Gun-Hee Lee, at a monthly meeting in 2002, ordered that the Samsung Group should introduce the sustainability concept into one company of its Group, based upon comparisons with globally leading companies mainly located in Europe. It was Samsung SDI that was selected to be the initial company of the Samsung Group to do so.
- Legal factors: Internal and external environmental laws have been continuously intensified primarily towards encouraging the use of environmentally-friendly products. In particular, RoHS **(**Restriction of Hazardous Substances**)** came into effect in 2006 based on the IPP (Integrated Product Policy) in Europe. RoHS and the expansion of "Environmental Declaration of Product Program" into Type Ⅲ from 2001 by the MOE in Korea are key drivers for sustainability management.
- Market rule: Together with the reinforced trend of the laws, recently, consumers have been highly aware of the impacts of hazardous substances contained in the electronic products on human health and safety. In 2003, Phillips, one of the major electronics suppliers, announced a Supple Declaration on Sustainability, which addressed the environment, health and safety, child labor, force labor, right to organize, collective bargaining, and discrimination issues.

In summary, Samsung SDI realized that it would lose its competitiveness and not sell its products sooner or later if it did not effectively cope with internal and external issues related to sustainability needs.

Taking everything into consideration of the observations of Samsung SDI's sustainability management in PDCA perspectives, the followings are valuable (see Table 3.18):

- The title of the sustainability report, 'I SEE SDI', reflects the characteristics of the company and its product. However, it is hard to identify the background of core factors for sustainability of Samsung SDI. According to the management philosophy and the current trend of the reports, technology innovation, especially environmentally-oriented technology was highly preferred in Samsung SDI in sustainability perspectives. Through interviews with the staff, this author identified that hazardous substances contained in its products, which are by internal and external laws, are key factors for its sustainability management. However, by focusing too much on the indicators of the 2002 GRI

Sustainability Guidelines, particularly in keeping with TBL factors, the importance of technology innovation in environmental perspectives was less emphasized in contrast with its importance in sustainability management of Samsung SDI perspectives.

Table 3.18 'State-of-the-Art,' of Sustainability Management in Samsung SDI

		Corporate Activities from the point of Triple Bottom Lines views
Plan	Stakeholder Analysis	·Emphasizing the relationship with the stakeholder in TBL perspective ·Not find the results of stakeholder analysis
	Business Principles	·Management Principles including 5 principles in TBLs sides; however, is Business Principles a little relevance in strategic management sides? ·The ambiguous linkage the management principle with Ethics policy in strategic framework sides. ·The ambiguous linkage the terminology named 'ethical standards' used in principle 1 with terminology named ethical management.
	Management Philosophy	·Generally, reflect sustainability concept. ·Ambiguous direction in Vision in TBL perspective
	Objectives	·Description focused on Actual results than upon objectives and targets
	Measures	·Show the indicators reflecting the performance of actual results. ·In case of the financial sector, presents highlight of key financial indexes.
Do	Awareness	·Provide wide range of training programs including Cyber program for enhancing competency, awareness internally and externally
	Organization	·Board of Director/Management Administration Office(MAO) under the direction of CEO/Sustainability Management Office ·Assigned Chief of Risk Officer (social & Environmental Risk), CFO(Financial Risk), CCO(Chief of Communication Officer) in the MAO
	Implementation	·Mainly focused on R&D activities ·In case of Purchase, Supply Chain Environmental Management through the purchase policy. Finally, set up Win-Win partnership with suppliers ·In case of manufacturing, applying cleaner production to the process ·Rarely find to play a role of Marketing department in sustainability ·Others; Information system for managing data control, and emphasizing the communication with the stakeholder; however, the stage of the communication seems to be just 'show me'. ·Various social contributions. Particularly, open-eye project is very suitable for the company. ·Partnership communities through the school, particularly, in the operating site.
Check	Self-diagnosis	·No Self-diagnosis in sustainability perspectives
	Third Party Verification	·Mainly address the facts regarding ISO 14001 certificate and designated as an environment-friendly company by the MOE. ·Verification of Sustainability Report; however, ambiguous verification report whether it got the assurance or not in case of 2004 Report ·Incorporated into SAM DJSI 2005 through analysis by SAM.
Act	Board of Director	·Pivotal role of Management Administration Officer (MAO) than Board of Director in sustainability management. Well organized in case of MAO. ·MAO, recognizing sustainability as a risk of company, held in the meeting regularly.
	Management Review	·President & CEO, strong commitment with sustainability management
Consistency		·Confirm the linkage of PDCA loop superficially. Maybe, one of reasons is in a manner of description based on actual result.

- It emphasizes the relationship with its stakeholders and then addresses the partnership with them. However, it did not show the results of stakeholder analysis. In addition, the stage of information openness, considering the demand of stakeholders, is in the 'Show Me' stage[56].
- It should have presented a strategic framework with sustainability. Particularly, the relationship between its business principles and ethical management or ethics policy must be clear and accurate for enhancing the completeness of the strategic framework and for implementing sustainability management systematically.
- It should strengthen the linkages among management philosophy, objectives and targets, related to the activities, and monitoring and checking the performance. The analysis should be focused on the objectives-oriented approach. It will be more helpful to show the causes or activities related to the success or failure of the objectives and targets.

Considering that the basic philosophy of the sustainability management is 'transparency', its verification activities should really be intensified internally and externally.

② POSCO

POSCO was founded in 1968 and currently employs a staff of approximately 19,377(as of late 2004). The construction of Pohang Works and Gwangyang Works, two premier steel works, were completed in 1983 and 1992, respectively; the works produce various steel products from hot rolled coil to stainless steel products. Not only is POSCO the leading player in the global steel industry, but it is also recognized by investors all over the world as a true global company. As of late 2004, its crude steel production reached 30.2 million tons per year, and hot-rolled steel, plate steel, wire rod steel, cold-rolled steel, electrical steel, stainless etc. are it's main products (hppt://www.posco.co.kr, POSCO Sustainability Report 2004).

Mission

We provide products and services that are essential to society and contribute to the sustainable development of humankind. POSCO envisions itself as a steelmaker with the highest values in the world, a company armed with the engine to continue growth into the 21st century through the development of human resources and a company with sustainable growth.

The background of POSCO to actively integrate sustainability management into strategic management in 2004 consists of three factors:

[56] Generally, the stages are classified as 5 stage as follow; 'Tell Me=present information without sufficient evidences', 'Show Me=present information with evidence', 'Prove Me=present information verified by the third parties', 'Discuss with Me' and 'Involve Me'= bilateral communication with stakeholders to solve sustainability issues related to the firm (source: *Stakeholder Engagement* by UNEP).

- **CEO's direction**: In early 2004, the CEO of POSCO, Mr. Lee, ordered POSCO to develop a sustainability report. It was the opportunity to actively integrate sustainability management into the existing strategic management.
- **The Necessity for 'Global POSCO':** Big steel companies have been born through M&A since 2000. Their production was based in various countries in the world. POSCO has also hoped to be bigger in the production scale sides through various approaches. It has invested in many steel factories in China. As a result, as of late 2004 it had almost twenty joint ventures (JVs), and had a MOU with India for building a steel factory for the annual production of 12 million crude tons. Accordingly, as a globally leading company, POSCO wanted to establish a new Management Philosophy that further heightened the existing philosophy of 'Strengthen Our Country through Steelmaking'. It has become a 'sustainability' philosophy for human beings.

The following observations of POSCO's sustainability management in PDCA perspectives are valuable (see Table 3.19):

- **The social needs and endeavors of the environment department in POSCO:** Together with the emergence of the climate change issue in 1994, environmental laws have encouraged POSCO's environmental management for environmental sustainability, even though it was through site-oriented management. In addition, the emergence of various NGOs, especially environmental NGOs, after 2000, has played a pivotal role in introducing sustainability management. The most vigorous environmental NGO in Korea has expressed great concern about POSCO's environmental activities since 2003.

In short, management for environmental sustainability (environmental management) has been introduced to POSCO relatively earlier than in other Korean companies to cope with internal and external environmental laws. However, the steel industry produces the interim material for automobiles, ship-builders, construction and steel itself is a highly environmentally friendly material that contributes to the preservation of our earth in many ways. In addition, its environmental management has been operated in a site-oriented manner. Judging from these circumstances, POSCO's sustainability management is in the initial stage and does not fully reflect its preference in sustainability perspectives. The strategic framework for sustainability will be well-organized in the future.

- The title of the sustainability report, 'The POSCO Movement: Business, Nature, Human', makes a favorable impression that it endeavors to carry out sustainable management and is in the initial stage in strategic perspectives. The last page of the cover, titled 'STEEL, OUR MOST PRECIOUS METAL', preferably give us a more valuable insight into the real direction for its sustainability taking the characteristics of steel industry into account. POSCO's sustainable management has only been carried out for the past two years. Raw materials from the TBL perspective may lie in a higher rank based on

natural resource including the steel industry for strategic sustainability management. Accordingly, POSCO should have a bigger interest in raw materials in the context of sustainability.

Table 3.19 'State-of-the-Art,' of Sustainability Management in POSCO

		Corporate Activities from the point of Triple Bottom Lines views
Plan	Stakeholder Analysis	·Emphasizing strongly the relationship with the stakeholder in TBL perspective. Directions suggested by the stakeholder are very impressive. ·Survey for identifying opinion of some stakeholders, Partnership with others. However, no evidence or information what kinds of opinion from the stakeholders.
	Business Principles	·No. However, Usage of Business Ethics as a substitution of business principles. By the way, it focuses on the commercial trade, not enough upon business principles for sustainability management in social and environmental perspectives. This is not clear. ※Establishing its Business Principle in sustainability perspectives ·The ambiguous role of Business Ethics in strategic sustainability management.
	Management Philosophy	·Generally, reflect the sustainability concept, and shared values, being consists of TBL factors, is more helpful to figure out POSCO's sustainability management philosophy. ·However, overlook the environmental side in its shared value.
	Objectives	·Description focused on actual results rather than objectives and targets ·In case of environmental sector, show the objectives and action plan of the year.
	Measures	·Show the indicators reflecting the performance of actual results. ·In case of the financial sector, presents highlight financial indexes. ·Particularly, POSEPI as a key indicator in the area of environment, but not easy to confirm the linkage with the objectives and action plan.
Do	Awareness	·Focus on the management strategy of growth and innovation, such as 6 Sigma, ethics etc. targeting mainly for its employees. And, environmental education program. No evidence the training program related to the sustainability.
	Organization	·In case of the Board of Directors, focus on the independency and transparency instead of the role in sustainability perspectives. ·Mainly highlight on the role of CSM Team and the relationship with KBCSD and IISI etc. ·Ambiguous organizational structure in sustainability perspectives.
	Implementation	·In case of R&D/Technology, Finex & environmental friendly products. ·Procurement, mainly focus on relationship with suppliers like benefit sharing program. ·Manufacturing, mostly related to environmental issues ·Rarely found to play a role of the marketing department in sustainability Just, cooperation with GM Daewoo. ·Others; IT framework after PI; the communication with the stakeholder through various partnership
Check	Self-diagnosis	·Self-diagnosis in environmental management perspectives was performed.
	Third Party Verification	·Mainly address the facts regarding ISO 14001 certificate. ·Verification of Sustainability Report is one of model in Korean business circles. ·Get reasonable assurance in the field of economy, and limited assurance in the field of mainly environment and society from the KPMG NL.
Act	Board of Director	·Pivotal role in sustainability management. ·Under the rebuild of various committee in the company in sustainability perspectives ·Environment and Energy Committee , held in the meeting regularly
	Management Review	·President & CEO, commitment with sustainability management
Consistency		·Confirm the linkage of PDCA loop superficially. Maybe, one of reasons is in a manner of description based on actual result.

- POSCO thinks that the real partnership with stakeholders is very important to meet the challenges of the future. It has recently recognized stakeholders as core risk factors. Therefore, it has tried to formulate partnerships with core stakeholders through surveys, holding forums, meetings, training, and supplying information. In-depth stakeholder analysis should be carried out for concrete relationships with stakeholders and, finally, for helping make progress towards a sustainable steel industry.
- A strategic framework for POSCO's sustainability should include several components. First, the management philosophy including shared values, corporate level strategies, and various actions for achieving objectives and targets should complement the TBL perspective. Second, business principles should be incorporated into its strategic sustainability management as a basic principle for its business. Business ethics is already in place. However, it is not enough to cover various issues related to TBL, focusing mainly on commercial behavior. Third, shared value should be composed of three factors such as 'Be the best in everything we do', 'Foster human creativity', and 'Value our principles of integrity and discipline'. The first and second factors from the TBL perspective are economically-oriented and socially-oriented respectively. However, the third factor seems to be more the principle for management than for shared value. It should be moved into the business principle or business ethics.
- This is a minor point in strategic management. It has various charters, principles, policies for business. Those documents should be arranged by hierarchy and show the relationships among them.

③ Hyundai Motor

First established in 1967, Hyundai Motor launched its "Pony" model in 1976, which was the first Korean-made automobile to be exported. Since the Pony, Hyundai Motor has continued to expand its export volume and overseas market to North America, Europe, China, Japan and other parts of the world. In 1984, Hyundai Motor exported 500 thousand automobiles; in 2004, it exported 1 million automobiles and received the "Ten Billion Dollar Export Award" from the Korean government. In 1991, Hyundai Motor built Korea's first engine and transmission parts. By doing so, it greatly contributed to the Korean auto industry by localizing the production of key components. Hyundai Motor produces passenger vehicles, light trucks, dump trucks, commercial buses, vans and other specialty vehicles including fire engines, petrol cars, ambulances and armored vehicles (www.hyundai-motor.com; Hyundai Motor Sustainability Report 2005).

Hyundai Motor's Sustainability Model

Hyundai Motor would like to take part in making the world a better place to live. We will realize our vision on sustainability by continuing our efforts to preserve the natural environment and social partnership.

Hyundai Motor produces 1,892,453 units per year, and as of late 2004, 53,218 employees were working in domestic sites and 61,951 employees worldwide.

The background of Hyundai Motor to actively integrate sustainability management into strategic management in 2003 consisted of the following three factors;

- Regulations on fuel efficiency including hazardous substances (e.g. RoHS) and Recycling (e.g. EUELV): Many countries, particularly in developed countries such as the USA, Japan, Canada, and the EU have introduced schemes to control fuel efficiency since the mid 1970's. The label system for fuel efficiency, the least fuel efficiency, Gas Guzzler tax, CAFÉ (Corporate Average Fuel Economy), Feebate (*Fee+Rebate*), and CO_2 control (185g/km → 140g/km in 2008) in EU are typical examples in the motor industry. Those regulations have been crucial factors for actively driving sustainable management from 2003. In particular, the CO_2 requirement by the EU has led to an improvement of almost 30% in fuel efficiency over the base year. Because the domestic market for selling cars has been almost saturated since 2000, these kinds of requirements must be complied with for overseas markets.
- Commitment of the CEO: The CEO, Mr. Mong-koo Chung, hopes to change from a merchant to an enterpriser through sustainability management. It means that Hyundai motor endeavors to restructure its business management system with sustainability as the key underlying principle.

In short, in the case of Hyundai motor, achieving sustainability is no longer a matter of planning and creating a fancy slogan but a real matter to be carried out immediately. It is the reason that Hyundai motor has reached its distinguished performance relatively quickly.

The following observations of Hyundai Motor's sustainability management in PDCA perspectives are valuable (see Table 3.19):

- The title of the sustainability report, 'The Road to Sustainability', emphasizes the facts that Hyundai Motor is the vehicle company; however, its title does not reflect the characteristics of the automobile industry in strategic sustainability perspectives. Actually, the experience of its sustainable management is only two years old. Taking the background of its sustainability management into account, the environmental issues, particularly fuel efficiency and hazardous substances, have played crucial roles in introducing sustainability management. Therefore, the contents related to them should be integrated into the title of its sustainability report within its strategic management.
- Hyundai Motor has a communication strategy which is titled 'Sustainable Communication Strategy'. Its purpose is to communicate with its stakeholders in a friendly manner about its efforts to achieve sustainability performance. However, the opinions of its stakeholders are not evident from the report, from the interviews, or from its webpage. Even though it is rough, the opinion of its stakeholders derived in the process of stakeholder analysis should be shown for the public to understand its

sustainability strategy clearly and accurately.

Table 3.20 'State-of-the-Art,' of Sustainability Management in Hyundai Motor

		Corporate Activities from the point of Triple Bottom Lines views
Plan	Stakeholder Analysis	·Emphasizing strongly the communication with the stakeholder in the TBL perspective. Accordingly, establishing a communication strategy and form partnerships with various stakeholders. Particularly, partnerships interlinked with Marketing. ·However, can not identify who are the core stakeholders of it, and no evidence or no information about what kinds of opinion from them
	Business Principles	·No. Even though Business ethic is applied to its business management, its role or purpose is not clear in sustainability management.
	Management Philosophy	·Clearly, reflect the sustainability concept in the vision and policy, particularly the slogan' title by 'Sustainable future between Men and Cars' is more valuable to understand the direction of its sustainability management.
	Objectives	·The framework of its objectives and target are clear and accurate to determine the situation of its sustainability management. ·Well-organized; Management Goal, mid-term strategy, 2004 management policy in TBL perspective. In the environmental area, the framework of objectives, activities, and status is clear at a glance, so that it is highly helpful to figure out its movement.
	Measures	·Show the key performance indicators in the area of environment, and core activities in the area of society. . ·Should be presented related to the indicators after the framework of its objectives, its sustainable activities will be advanced.
Do	Awareness	·HRM department have willingly striven to enhance the awareness of its employees about sustainability.
	Organization	·Board of Directors: The independency and transparency is not enough in sustainability perspectives ·Mainly, environmental management strategy planning team plays pivotal role for drive of its Sustainability as a secretariat of environmental committee. ·Environmental Committee consists of environmental product, production, and management sub-committees.
	Implementation	·R&D is crucial role for product innovation and cleaner production in the environment area. ·Procurement, mainly with suppliers through the SCEM project, and marketing, with the customer. ·Others; the communication with the stakeholder through various partnership
Check	Self-diagnosis	·Self-diagnosis in environmental management perspectives was performed.
	Third Party Verification	·Mainly address the facts regarding ISO 14001 certificate. ·Verification of Sustainability Report; it is one of model in Korean business cases. ·It gets the limited assurance from the Deloitte.
Act	Board of Director	·Until now, CSM Team, pivot role in sustainability management. ·Under the rebuild of various committee in the company in sustainability perspectives ·Environment and Energy Committee, held in the meeting regularly.
	Management Review	·President & CEO, commitment with sustainability management
Consistency		·Confirm the linkage of PDCA loop.

▪ The strategic framework for its sustainability including the concept of terminologies such as sustainability, sustainable management, and sustainable communication is highly valuable information

to determine the direction of sustainability management. Furthermore, it may be helpful to enhance the transparency of its sustainability management. However, with regard to the relationship among its terminologies, in the case of 'sustainable management', to be descriptive focusing on the definition of sustainability, it is more helpful to understand its 'State-of-the Art,' in sustainability perspectives.

- Business ethics are also key issues to be solved in strategic management perspectives. Ethics is a normative and mind-oriented terminology. Therefore, it is not easy to be integrated into the business strategy in industrial circles (See section 4.3.7 of chapter 4). However, the author of this dissertation thinks that all activities should be integrated into the business strategy. That is to say, its business ethics should be consolidated into its framework of strategic sustainability management.

2) Globally leading companies in the world

In order to understand TBL activities in the context of the 'State-of-the-Art,' of key Korean firms, this dissertation author compared the 'State-of-the-Art,' of them with that of globally leading companies in the same sector. It clarifies differences between leading companies in Korea and in the world in sustainability perspectives.

① PHILIPS

Philips was founded in 1891, and has expanded its business areas from making carbon-filament lamps to a medical X-ray tube in 1918, television in 1925, radios in 1927, electric shavers in 1939, the Compact Audio Cassette with integrated circuits in 1965 based on the breakthrough inventions by its R&D activities. Their flow of new products and ideas continued throughout the 1970s with products such as the PL and SL energy-saving lamps, LaserVision optical disc, the Compact Disc and optical telecommunication systems were produced. As a result, as of 2004 Philips' business areas cover medical systems, domestic appliances and personal care, consumer electronics, lighting, Semiconductor, and others including corporate technology, corporate investment, and design etc. It is also involved in several joint ventures with the following key participants; LG Philips LCD(44.6%), LG Philips Display (50%), Lumileds Lighting(48%), Inter Trust Technologies Corporation (49.5%), Philips medical capital (40%) etc.

The activities of the Philips' group are organized in six operating product divisions based on business areas. Philips' products are sold in about 150 countries, to a large extent through its own national sales and service organizations. Industrial activities are spread widely across regions, comprising 141 manufacturing sites in 32 countries as of 2004. Its sales and employees are of a multinational scale at EUR 30,319milion and 161,586 persons respectively (http://www.philips.com and sustainability report 2004). The appropriate direction of its sustainability management which Philips strives to pursue is clearly reflected in the CEO's message that states:

Sustainability of Philips

*At Philips, we are in the unique position to link our brand heritage to the challenge of improving the quality of people's lives. This is what Philips has done since our founders started the company. For Anton and Gerard Philips there was no difference between business and sustainable business. Putting people at the center was inherent in their way of doing business. You could say sustainability is in our DNA. We have long been integrating the triple bottom line, striving for economic prosperity, environmental quality and social equity. Sustainability is built into our heritage, our values and our commitment to improve the quality of people's lives (*http://www.philips.com;*Philips Sustainability Report, 2004).*

Building knowledge, exploring opportunities

We have made great strides in building knowledge and creating awareness of sustainability throughout the company. Now we are taking our commitment to a higher level. In keeping with our philosophy of continuous improvement, we are working to strengthen our performance against the triple bottom line. Our efforts are wide-ranging, from improving our process of reporting on our sustainability performance to stakeholder dialogue to supplier management to diversity and inclusion to EcoVision. Sustainable development is a necessity and the right thing to do. It's also is our way of doing business – an investment that creates value and secures our future (http://www.philips.com).

The history of Philips to integrate sustainability management into strategic management began almost 30 years ago. The main reason was due to environmental problems. 'The Rome Club' in 1968 had published 'the Limits to Growth' due to environmental pollution. The Environmentally Sound and Sustainable Development (ESSD) adopted at the Rio Summit in 1992 encouraged Philips to develop sustainable management that was then focused upon environmental issues. It introduced the 'Eco-design' concept to its products in 1994. Social issues like profit sharing with core stakeholders have played a vital role in integrating sustainability into the existing management strategy since the 1960s. (Based upon an interview with the Senior Vice President in charge of the Sustainable Management Office, 2005)

Table 3.21 'State-of-the-Art,' of Sustainability Management in Philips

		Corporate Activities from the point of Triple Bottom Lines views
Plan	Stakeholder Analysis	・The results of 'Reputation Study' in 2003 for 8 countries were based on the sustainable strategy of Philips. ※Reputation Committee: Chaired by the CEO, deciding to focus on one of key drivers for reputation-performance management. ・Identifying key opinion leader by stakeholder, and forming the main interface between it and stakeholders. ・In case of customers, identify core customer per product division.
	Business Principles	・Establishment of 'General Business Principles' such as the principle of implementation of sustainability strategies. ・It consists of general commitment, commitment by stakeholders, Assessment and evaluation, Business integrity, Observance of GBP etc.

	Management Philosophy	・Well organized, Mission, Vision, Strategy, and Values; it clearly shows their belief in the sustainability perspectives. See the following quote: 'It is our firm belief that socially and environmentally responsible behavior contributes to sustained profitable growth and value creation. That's why we are embedding sustainability thinking and acting in all or our daily activities. This is our philosophy and a cornerstone of our strategy.'(Sustainability Report 2004)
	Objectives	・Clearly shows the performance progress of sustainable management with the presentation of actual results by sectors at the main body in 2004 and Sustainability KPI Target for 2005 at the section of 'Sustainability at Philips'.
	Measures	・Measuring performance related to Key performance indicators; such as sustainable business through eco-efficiency, stakeholder dialogue, health and safety etc.
Do	Awareness	・It put 'people', customers, employees, and the communities where it operates, at the center of its social responsibility. ・It has various awareness (learning and development) programs, which strive to be 'One Philips in the World".
	Organization	・Well organized in sustainability management. Information in detail is presented in the,"Embedded Governance Structure" on p.16 in its Sustainability Report 2004. ・The Structure: Board of management/Group management committee, Sustainability board, Sustainability network and Sustainability management at product division, business, and regions ・The characteristics: Linkage each Board or committee with Sustainability management at product division, business, and regions. .
	Implementation	・R&D & Product Development: R&D expenditure, 8.4% of Sales. It developed many products highly evaluated from environment perspectives. ・Purchase : Eco-design program, 'Green Flagships' and mainly great concerns on its suppliers. Thus, it established the 'Supplier Declaration on Sustainability' for contributing to the sustainable development. 2,800 key suppliers agreed to adhere to the principles. As well, show lists of banned substances. ※ Green Flagships: Products selected by Eco-design approach. ・Marketing and communications: Customer relationship management and Partnership with various stakeholders for the efficient communication. ・Others; Social investments using a targeting approach. It means that they link initiatives with the company's scope of business, focusing on health and education, preferably with employee volunteerism. Projects are selected based on their potential to improve people's lives by providing access to healthcare and education, particularly for the underprivileged. ※'The Philips Embedded Model': To drive sustainability throughout the organization and to involve all employees.
Check	Self-diagnosis	・Self-diagnosis in environmental management perspectives ・Provide a self-assessment tool to Suppliers. Supplier certification reviews for key suppliers are performed under the supervision of qualified internal auditors or selected external auditors.
	Third Party Verification	・Mainly address the facts regarding ISO 14001 certificate. ・It gets the limited assurance in the social and environmental area from the KPMG NL, but reasonable assurance in the economic area from it.
Act	Board of Director	・Board of Management/Group management committee has six meetings every year.
	Management Review	・CEO, commitment with sustainability management. Co-chair of a Reputation committee
Consistency		・Confirm the linkage of PDCA loop in sustainability perspectives. The framework of strategic sustainable management is well organized for its continuous improvement. ・The consistency of the documentation for sustainable management is also clear and accurate; Philosophy-Strategy-Policy in TBL perspective etc.

- The title of the sustainability report, ‘Dedicated to sustainability; our way of doing’, reflects the fact that Philips is a highly respectable firm in the electronics field. The interview and sustainability report gives insight as to why it uses this kind of title for its sustainability report. However, it does not recognize what is its challenge in strategic sustainability perspectives.
- Philips really thinks that communication is highly important for sustainable management. Partnership by opinion leaders and a reputation study are valuable to understand its efforts in communication with core stakeholders in sustainability perspectives.
- Strategic framework for sustainability, organization structure, and the concept of sustainable management, ‘is built into our heritage, our values and our commitment to improve the quality of people’s lives by integrating economic prosperity, environmental quality and social equity – balancing these sometimes – competing demands, are highly valuable information to figure out the direction of sustainability management.’ Furthermore, they may be helpful to enhance the transparency of its sustainability management. Particularly, the strategic framework suggests business circles for sustainable management.

② Arcelor

Arcelor was created in February 2002 by three steelmaking companies, Aceralia, Arbed and Usinor, with the intention of establishing a company that would lead the global steel industry. It operates in four key market sectors: Flat Carbon Steel, Long Carbon Steel, Stainless Steel and Arcelor Steel Solutions & Services. It is a leading force in the transformation of the global steel industry. With a turnover of 30 billion euros and shipments of 43.9 million ton of steel in 2004, the company is a major player in all its main markets: automotive, construction, household appliances and packaging as well as general industry. It had 95,000 employees at the end of 2004 work in over 60 countries.

The company places its commitment in sustainable development at the heart of its strategy and ambitions to become a benchmark for economic performance, labor relations and social responsibility in the world of steel. The vision, ‘Steel Solutions for a better World”, tells everything regarding its sustainable management.

***Sustainability of Arcelor*: Steel Solutions for a better World**

Steel Solutions mean developing a set of services complementary to our products to better meet the expectations of our customers with whom we work as partners in a true win-win relationship.

For a better world: The environmental impact of the steel solutions that we offer to our customers is under our control (recyclability, durability, weight reduction, robustness). The same goes for the production methods implemented by the various entities of the Group. The way we operate must also guarantee our economic survival and the quality working conditions enjoyed by our employees. By promoting steel, Arcelor's goal is also to improve living conditions worldwide. Steel, because of its

qualities of strength and versatility, offers a more pleasant living environment and improves everyday safety; Buildings and construction, Automotives, Packaging, Household appliances (http://www.arcelor.com)

The main reason for Arcelor to integrate sustainability into its strategic management is that it hopes to unify three companies with the different cultures as 'one company' to share the same corporate culture based on sustainability. It hopes to be born again as a global leading company just like the best company in the world in production capacity perspectives in 2002.

Table 3.22 'State-of-the-Art,' of Sustainability Management in Arcelor

		Corporate Activities from the point of Triple Bottom Lines views
Plan	Stakeholder Analysis	·Arcelor Sustainability Model: 4 P's Approach, it aims to have a relationship as a 'Partner' with Stakeholders. It identifies the 6 key stakeholders (shareholders, employees, financial institution, client & suppliers, Neighbors – Residents, Communities - NGOs) as the Partners. ※4P: Profit, People, Planet, Partner ·'Dialogue with the stakeholders' is one of 8 priorities for its sustainability. In the priority, its main targets are the employees and the community where its site operates. It has a dialogue European Work Council in order to foster workplace safety, conducts satisfaction surveys for personnel in Brazil, and has open day in all large production sites.
	Business Principles	·Establishment of 'Principles of responsibility' as its business principle stating the vision and standards of behavior of the Arcelor Group ·The key contents consist of the commitment to its core stakeholders like customers, shareholder and financial institutes, business partners, and the community with the sentence such as, 'People are at the center of Arcelor'.
	Management Philosophy	·Well organized, and show the sustainability of Arcelor in its Vision, Mission, and Ambition. As the above can see, the vision, 'Steel Solution for a Better World', is highly meaningful in sustainability perspectives, reflecting the characteristics of steel industry.
	Objectives	·Show well the performance progress of sustainable management with the presentation of 'Achievements and Priorities' section in main body of Sustainability Report. It consists of 'Arcelor 8 Priorities', 'Main Achievements 2003, 2004', 'Area for Improvement/Objectives'. ·Presents its objectives by the 8 priorities (group profitability, health & safety, environment, dialogue with stakeholders, skills development, Innovation & Quality, Corporate Governance, Responsible citizenship)) clearly and accurately.
	Measures	·Measuring up and showing the performance related to Key performance indicators by the 8 priorities of Arcelor.
Do	Awareness	·Priority 5 is 'Skill Development'. It mainly includes the awareness or its employees and the relationship with the stakeholders in environmental and social perspectives.
	Organization	·The Structure: Management Board and Corporate/ Activity Sectors(4 areas of activity)/ Business Units in these sectors ·Management Board supported by Corporate management team including R&D, Purchase, Finance, Strategy etc.
	Implementation	·Show the sustainability activities by the 8 priorities almost related to the department by value chain like R&D, Purchase, Manufacture, HRM etc. It is due to the structure of its organization. ·In case of purchase, it has 'General Purchasing Condition' align with its Principle of Responsibility

Check	Self-diagnosis	·No evidence.
	Third Party Verification	·Mainly address the facts regarding ISO 14001 certificate. ·In case of Arcelor Report, the business sector gets the reasonable assurance from the KPMG Luxemburg; however, environmental and social data were not included in its assurance scope.
Act	Board of Director	·No Evidence.
	Management Review	·CEO, Co-chair of management board, commitment with sustainability management.
Consistency		·Confirm the linkage of PDCA loop in sustainability perspectives. The framework of strategic sustainable management is well organized for its continuous improvement. ·The consistency of the documentation for sustainable management is also clear and accurate; Principle of responsibility including Vision-Mission-ambition, Health and Safety and environmental Charter/Policy, and a guide and condition etc in TBL perspective etc.

- The title of the Report, 'Steel Solution for a Sustainable World', reflects the facts that Arcelor is a steel company, and it also shows clearly what it is going to do in sustainability. Its vision shows the willingness of Arcelor to make a sustainable world through steel.
- Thought its 4P's approach for sustainability, the importance of dialogue with stakeholders is presented. However, the information regarding the results of stakeholder analysis was not acquired from the interview and or from their sustainability report of 2004.
- Strategic framework for its sustainability and organizations structure is valuable information to help one to understand the direction of its sustainability management. These help to enhance the transparency of its sustainability management.
- The Achievements and Priorities based on its objectives are helpful to understand the status of related projects and its sustainability. However, the verification, internally or externally, for its sustainability report should be conducted for transparency and objectivity.

③ TOYOTA[57]

Toyota Motor Corporation is one of the world's leading automakers, offering a full range of models, from mini-vehicles to large trucks. Global sales of its Toyota and Lexus brands, combined with those of Daihatsu and Hino, totaled 6.78 million units in CY2003[58]. Besides its own 12 plants and 11 manufacturing subsidiaries and affiliates in Japan, Toyota has 51 manufacturing companies in 26 countries/locations, which produce Lexus- and Toyota-brand vehicles and components. As of March 2004, Toyota employed 264,000 people worldwide (a consolidated basis), and markets vehicles in more than 140 countries. Automotive business, including sales finance, accounts for more than 90% of the

[57] In case of the analysis of the TOYOTA, the results in the dissertation are based only on the Website (http://www.toyota.com), *and the Annual Report 2004* and *Environmental and Social Report 2004* provided by TOYOTA Corporation.

[58] Total retail unit sales of Toyota/Lexus, Daihatsu and Hino vehicles

company's total sales, came to a consolidated ¥17.29 trillion in fiscal year 2004. Diversified operations include telecommunications, prefabricated housing and leisure boats

The sustainability management which TOYOTA thinks and strives to pursue is well reflected in the CEO message and Vision 2010 as follows:

Sustainability of TOYOTA: *Harmony with people, Society and the Environment*

Since its founding, our company has been aiming to enrich society through car making. Our goal is to be a "good corporate citizen," constantly winning the trust and respect of the international community. Continuing in the 21st century, we aim for stable long-term growth, while striving for harmony with people, society and the environment.

From this perspective, centered on the theme "Innovation into the Future," the Toyota Global Vision 2010 proposes the corporate image for which all of Toyota should strive and the paradigm changes Toyota should undergo. Under Toyota's Basic Principles, we practice openness and fairness in our corporate activities, strive for cleaner and safer car making, and work to make the earth a better place to live. We would like to thank everyone for his or her continuing support (www.toyota.com).

Toyota's Global Vision 2010 (Announced in April 2002): Innovation into the Future - A Passion to Create a Better Society

Through "Monozukuri - manufacturing of value - added products" and "technological innovation," Toyota is aiming to help create a more prosperous society. To realize this, we are addressing the following themes:

(1) Be a driving force in global regeneration by implementing the most advanced environmental technologies

(2) Creating automobiles and a motorized society in which people can live safely, securely and comfortably.

(3) Promote the appeal of cars throughout the world and realize a large increase in the number of Toyota fans.

(4) Be a truly global company that is trusted and respected by all peoples around the world.

The main reason of TOYOTA to integrate sustainability into business activities in strategic management perspective is the challenge of environmental issues which the motor firms can not be free from. It has sincerely striven to search for solutions through environmentally friendly technology for a long time. Sustainability management was recently incorporated to drive R&D activities systematically.

The following observations of TOYOTA's sustainability management in PDCA perspectives are valuable (see Table 3.23):

- Together with the 'Fourth Environmental Action Plan' in 2004, Toyota announced '*Harmony with people, Society and the Environment'* which aims for stable long-term growth, while striving for harmony with people, society and the environment. From this perspective, centered on the theme "Innovation into the Future - A Passion to Create a Better Society," the Toyota Global Vision 2010

proposes the corporate image for which all of Toyota should strive and the paradigm changes Toyota should undergo. It means openness and fairness in our corporate activities, strive for cleaner and safer car making, and work to make the earth a better place to live.

- In the 'Guiding Principle at Toyota' written in TBL perspectives, the basis of sustainability management in Toyota is its sound relationship with stakeholders. However, information regarding the results of stakeholder analysis was not presented in their 2004 report.
- For coping with environmental challenges, Toyota's R&D activities are very impressive. In the decision making process for R&D, environmental issues seem to be a chief priority.
- Toyota has conducted various self-diagnoses such as the interim review of the Toyota Environmental Action Plan, risk diagnosis focusing on management of risks arising from production activities, and environmental management system audit. The results of them are vague and make it difficult to understand their efforts to strengthen its product in environmental perspectives. In addition, the verification for environmental and social reports, internally or externally, was not conducted. The author of the dissertation could not find the evidence verified by third parties in its report.

Table 3.23 'State-of-the-Art,' of Sustainability Management in TOYOTA

		Corporate Activities from the point of theTriple Bottom Line perspective.
Plan	Stakeholder Analysis	·A sound relationship with the Stakeholders seems to be highly valued in the TOYOTA Corporate. 'Guiding Principles at Toyota' contains Customers, Employees, Business Partners, Shareholders, and the Community as Its core stakeholders. ·However, the Report does not present any information related to Stakeholder Analysis on its core stakeholders.
	Business Principles	·Establishment of 'Guiding Principles at Toyota' consisted of 7 items[59] in sustainability perspectives.
	Management Philosophy	·In sustainability perspectives, its management philosophy is revealed in the Vision 2010 established in 2002, and 'Guiding Principle at Toyota' (Innovation into the Future - A Passion to Create a Better Society).
	Objectives	·Its Fourth Environmental Action Plan was announced at May 2005 calling for the company to become 'a leader and driving force in global regeneration by implementing the most advanced environmental technologies.' The plan focuses on four major issues; 1) energy/ global warming, 2) recycling of resources, 3) management of substances of concern and 4) atmosphere quality. ·However, the objectives in detail were not presented in the Report and the Internet.

[59] · Honor the language and spirit of the law of every nation and undertake open and fair corporate activities to be a good corporate citizen of the world.
· Respect the culture and customs of every nation and contribute to economic and social development through corporate activities in the communities.
· Dedicate itself to providing clean and safe products and to enhancing the quality of life everywhere through all our activities.
· Create and develop advanced technologies and provide outstanding products and services that fulfill the needs of customers worldwide.
· Foster a corporate culture that enhances individual creativity and teamwork value, while honoring mutual trust and respect between labor and management.
· Pursue its growth in harmony with the global community through innovative management.
· Work with business partners in research and creation to achieve stable, long-term growth and mutual benefits, while keeping ourselves open to new partnerships.

	Measures	·In its environmental and social report, the indicators which one can see the rate of progress of the action plan are not enough to figure out its progress of environmental activities comparing with its objectives. ·Information related to social issues was also presented as the type of real activities in 'Community Care' perspectives.
Do	Awareness	·It thinks that personnel are the most precious management resource that a company has in the achievement of sustainable development. ·It is implementing thorough employee training programs for enhancing capabilities, particularly striving to share the Toyota Way Values in the manufacturing workplace and in management. ·The Toyota Way is based on the dual pillars of 'Respect for People' and 'Continuous Improvement', which comprise five principles: Challenge, Kaizen, or improvement, Genchi Genbutsu, or go and see; Teamwork; and Respect.
	Organization	·The Structure: Management Board, Senior Managing Director and Managing Officer. ·Linkage with 6 committees including philanthropy, ethics, and environment etc. ·For Environmental Management: Toyota environment committee was sub committee for product, production, recycling respectively.
	Implementation	·R&D department, show the strong activities for development of environmental friendly vehicles. Key areas of the technology are (1) environmental technology, from the improvement of conventional engines to the development of a fuel-efficient car that runs on clean-burning fuel, (2) safety technology, friendly to both people and the earth, (3) IT technology, focusing the two perspectives of 'increasing vehicle functionality' and 'enhancing the transport system'. ·According to it's the direction of sustainability management, various contributions to the community where it operates, mainly focusing on awareness on environmental problem and training.
Check	Self-diagnosis	·Conduct self-diagnosis for its environmental management system based on ISO 14001 and interim review of the progress of its action plans in all areas. ·Reinforcement of Risk management in environmental perspectives: Focusing in particular on management of risks arising from production activities as a top priority.
	Third Party Verification	·For environmental management system based on ISO 14001. ·In case of Toyota Report(business sector), the reasonable assurance from the PWC.
Act	Board of Directors	·Review sustainability issues considering the characteristics of organizations.
	Management Review	·CEO, commitment with sustainability management, particularly technology development coping with environmental issues.
Consistency		·Form the linkage of PDCA loop roughly in sustainability perspectives. Organization structure for sustainability management was formulated clearly. ·However, it is ambiguous that its organization was managed efficiently, especially activities for 'Check' were not enough for assure its sustainability.

3.4 Summary and Conclusions

Recent shifts of policies and measures on the emerging sustainability management paradigm which were initiated by Korean governmental agencies such as PCSD, MOCIE, MOE, and local governments have recently challenged the Korean business circles focus increasingly upon harmonizing the environment with the economy based on the ESSD announced by the UNEP. They have urged Korean industry to make real progress towards sustainable society through better utilization of natural resource, economic contribution to society and improved environmental pollution control by the introduction of various policies which promotes environmentally-friendly industrial structure, the encouragement of

environmental industry and technology, and the facilitation of corporate environmental management (See Table 3.1). The Industrial Policies for sustainable industry aims to achieve the development of environmental-friendly industry; however, in a strict sense, they were alienated from the development of sustainable development. That is to say, recent Korean industrial policies only focused on environmental issues without sufficient consideration toward TBL perspectives. *B.W. Lee and G.C. Kim (2000)* have also clarified that policies and measures by Korean government agencies related to sustainable industry have contributed somewhat to handle some environmental issues, but they were sufficient due to lack of consideration for sustainability. The direction of industrial policy should have been focused more on sustainability issue as industrial paradigm is changing.

In addition, this dissertation relies on several indicators regarding the sustainability of Korea as evaluated by international organizations such as WEF, IUCN, and IDRC. At the cost of the unprecedented economic and social development in Korea, its eco-system has been heavily damaged and, even now, still faces great pressure because of the needs of socio-economic growth.

The key reason for this ecological deterioration is due to the weaknesses in natural resource management. The consumption of natural resources in business circles has continuously increased, even though the growth rate slowed down in the late 1990s. In particular, high growth in energy intensive manufacturing resulted in increases of energy consumption in the 1990s, and resulted in serious environmental pollution. Since the 1960s, in the early stages of Korean industrialization, natural resources and the environment were not considered as critical issues because eradication of absolute poverty was the main target in the industrializing process. Furthermore, environmental issues were not addressed during the high growth period which focused on heavy-chemical industries and an export-driven policy. Korea's industrial structure will ultimately lead to severe contamination, and this is one of the reasons why Korea is being pressured by international society.

Although there are now signs for Korea's industrial structure to convert towards environmentally-friendly industrial structure due to government's environmental policies, its degree of environmentally-friendly industrial structure in a sustainable competitive advantage perspective did not reach a satisfactory level during the period from 1985 to1999.

In the meantime, the percentage of value-added in eleven highly polluting manufacturing industrial sectors (dyeing, leather, paper, petrochemical, cement, iron and steel, non-ferrous metal, casting, plating, electronics and automobile) to that of all manufacturing, has been increased from 67.2% in 1985 to 72.2% in 1999, despite the fact that the percentage among most advanced countries has been decreased during the same period (See Table 3.15). Korea now ranks 10th among 127 countries in terms of a number of companies with ISO 14001 certification at the end of 2004 (See Table 3.16). Yet less than 100 Korean firms have published environment and sustainability report. In 1995, just one company (POSCO) has published an environmental report and until 2000, about only 10 firms have published

environmental reports in Korea.

It seems that quite a few corporations have been interested only in obtaining certificates of environmental management systems. The number of Korean firms regularly publishing environmental or sustainability reports is relatively small in scale, compared with the percentage of companies with certificates for environmental management systems. The number of companies that obtained assurance from verification of an environmental and sustainability report is an extreme minority.

Due to great pressure from international society however, various policies towards sustainable industry in Korea have been prepared and they have had a great influence on Korean business circle, particularly on a few large scale firms in Korea. These big firms have been in the process of integrating strategic environmental or sustainability thinking into their strategic decision making framework. As a result, two companies, POSCO and Samsung SDI, are now included in the Dow Jones Sustainability Index as of 2005 (See footnote 7 at page 9 in Chapter 1).

In this dissertation, three Korean companies, Samsung SDI in the electronic industry, POSCO in the steel industry, and Hyundai Motor in the automobile industry, were studied in-depth by literature review. They have made great contributions to the continuous growth of Korea and have had independent third party assessments of their TBL efforts. The current 'State-of-the-Art,' for the sustainability for Korean business circles was analyzed. Additionally other globally leading companies in the same types of industry were analyzed. The companies studied included the following: Philips, Arcelor, and Toyota, which were chosen to compare with the sustainability of Korean companies. PDCA perspectives (see Table 3.17) were applied for the analysis of ''State-of-the-Art,'' of sustainability management that includes a focus upon items such as:

- The sustainability management of Korean companies has been significantly influenced (explain and underpin more specifically) by various government policies including the measures of international organizations from a sustainability perspective. In this respect, globally leading companies have similar situations with Korean companies. This is particularly true with the companies of the electronics and automobile sectors, which produce the final consumer goods. Recently, a series of environmental laws focusing on the ban on products containing hazardous substances and corporate social responsibility focusing on a wide range of stakeholders including customers, the community, and the natural environment have become the top corporate priorities and thus became key criteria for rating the integrity of companies.
- The direction and focus of sustainable management differs according to the characteristics of the industry. The companies of the electronics and automobile sector, which produce final consumer goods, have had a great interest in products and technology related to value chain perspectives, as well as customer and employees in stakeholder perspectives for their sustainability. However, the steel

industry, which produces intermediate goods, has had more interest in improving energy efficiency in this energy intensive sector. They have also focused upon making improvements in other technologies and upon the community including NGOs and employees from stakeholder perspectives.

- Both Korean and globally leading companies nominally and virtually have the same situation according to the PDCA analysis framework. They state a predominant management philosophy including a CEO message in the Plan stage, conduct HRM activities for awareness and R&D activities proactively for coping with new challenges in the Do stage, acquire the certificate and the assurance regarding the data and activities of their sustainable management in the Check stage, and have a management review regarding sustainability issues in the Act stage. The differences between Korean companies and globally leading companies were identified in each stage:

  (1) In the ***Plan*** stage, the importance of stakeholders analysis, the business principle including a wide range of international standards, laws and regulations in sustainability perspectives, business ethics or codes of conduct as a basic compliance for business activity, and objectives and measures systematically based on the management philosophy were identified more clearly and accurately in the globally leading companies than in Korean companies.

  (2) In the ***Do*** stage, organizational charts of global companies for sustainability management were more comprehensive and systematic than those of Korean companies. In value chain perspectives, the sustainability concept in the case of globally leading companies was well embedded in their core functions such as R&D, purchase, manufacturing, and marketing compared with those of Korean companies. The main reasons seem to be due to the experience of industrialization and the scope of the market. First of all, Korean firms should redesign the role and responsibility on the basis of sustainability SWOT, and ultimately the sustainability concept should be integrated into the decision-making process. This will bring Korean companies up to the standard of globally leading companies and help them achieve true sustainable competitive advantage.

  (3) In the framework of strategic management perspectives, the structure of the globally leading companies for sustainable management is more clearly and accurately developed than that of the Korean companies. The role of business ethics and codes of conduct for ethical management is very ambiguous in the framework of strategic management, especially the business or sustainability principle, which includes a wide range of requirements for sustainability management such as international conventions, external and internal laws and regulations, and business ethics. They should be contained as a basic direction for implementation of sustainability strategies. According to the PDCA analysis, stakeholder analysis should be carried out to establish a strategic objective in sustainability perspectives.

According to changes in business circumstances and industrial policies by the Korean government, leading Korean companies have striven to introduce new sustainability management and to integrate it into the decision making process. However, the ‘State-of-the-Art,’ of leading Korean companies is still in its infant stage compared with the ‘State-of-the-Art,’ of globally leading companies according to PDCA perspectives through the analysis (See Table 3.18~3.23). In particular, the Plan and Do stages, preferentially, in PDCA should be improved in order to carry out a strategic management framework systematically and thus enhance their corporate value. The author of this dissertation believes that it is not easy to embed new business approaches into the framework of the existing strategic management in a short period of time right after sustainability management was introduced. Furthermore, without any improvement in Plan and Do stage, the integration of sustainability into the existing strategic management might be futile.

CHAPTER 4. CURRENT INSIGHTS INTO CORPORATE SUSTAINABILITY MANAGEMENT

4.1 Introduction

CSM has become a major area of research in the field of strategic management as sources of sustainable competitive advantage for firms. As a result, a growing number of firms are incorporating sustainability concepts into their strategic management. Various terms such as: environmental management, corporate social responsibility, corporate citizenship and corporate sustainability are used to describe the approaches to achieve sustainable competitive advantage. In Korean business circles, the concept of ethical management is also used. This multitude of terms and concepts has led to confusion in business circles, becoming major obstacles in integrating sustainability into strategic management. Therefore, this chapter examines terms and criteria related to corporate sustainability used by rating institutes, and presents the concepts and definitions for corporate sustainability. This analysis answers *Research Question 1* put forward in Chapter 1.

RQ1: What factors are generally considered for strategic corporate sustainability (in Korean business circles)?

Section 4.2 reviews the concepts and definitions of key terminologies related to Corporate Sustainability such as sustainability/sustainable development, environmental management, social responsibility (including corporate citizenship and business ethics), stakeholder management, and corporate accountability. Finally, this section provides a definition of corporate sustainability. In particular, in this section, the author of this dissertation reviews various perspectives of CSM considering the relationship with sustainability, the purpose of corporations, and the conformity with strategic management. Section 4.3 analyzes arguments of some researchers and the criteria of key sustainability rating institutes including GRI and related groups for providing industrial guidance for achieving TBL. In section 4.4, the author presents the model that is used for the case study presented in Chapter 5.

Based on the definition of CSM (see 4.3), this dissertation provides the framework of strategic sustainability management and establishes a matrix for cross-tabulation that is composed of business success factors and sustainability factors.

4.2 Definition of Corporate Sustainability Management

Sustainable development, environmental management, corporate social responsibility, stakeholder engagement and accountability may be the five pillars of CSM. CSM is an evolving concept that managers are adopting as an alternative to the traditional growth and profit-maximization model. This term is often used in conjunction with and in some cases as a synonym for, other terms such as

"sustainable development", "corporate social responsibility," and “corporate citizenship.” In particular, ethical management has been used as a synonym for CSM in Korean business circles. Based on the understanding of these terminologies, CSM is defined in this section. Each concept, and its relationship to corporate sustainability, is discussed below.

The dissertation emphasizes that corporate sustainability can be viewed as a new and evolving corporate management paradigm. The term 'paradigm' is used deliberately, in that corporate sustainability is an alternative to the business model in which growth and profit-maximization must be pursued traditionally. While corporate sustainability recognizes that corporate growth and profitability are important and basically the same point of view, it also requires the corporation to strive to have a relationship with a wide range of stakeholders in order to reach the societal goals, specifically those relating to sustainable development - environmental dimensions, social dimensions, and economic dimensions.

The review of the literature suggests that the concept of corporate sustainability borrows elements from five established concepts: 1) sustainable development, 2) environmental management 3) (corporate) social responsibility, 4) stakeholder engagement, and 5) corporate accountability.

4.2.1 Sustainable Development[60]

Sustainable development is a broad, dialectical concept that balances the need for economic growth with environmental protection and social equity. It embodies the promise of societal evolution towards a more equitable and wealthy world in which the natural environment and our cultural achievements are preserved for generations to come (Dyllick and Hockerts, 2002). The question of economic growth and social equity has been a major concern for most of the past 150 years. By adding concern for the carrying capacity of natural systems, sustainable development thus, ties together the current main challenges facing humanity (Dyllick and Hockerts, 2002). In the mid-1970s, the term ‘sustainable development’ was first used by Barbara Ward, the founder of the International Institute for Environment and Development (IIED), to make the point that environmental protection and economic development are linked (Ward and Dubos, 1972). Conry and Litvinoff (1988) defined sustainable development in terms of people’s well-being as an improvement of people’s physical well-being through using natural resources at a rate that can be sustained permanently or at least over scores of years, living off nature’s interest rather than depleting its resources. On the other hand, Pearce et al. (1989) introduced over twenty kinds of perspectives on sustainable development, out of which they have derived their general definition[61]: Sustainable development means either that per capita utility or well-being is increasing over

[60] Tim O’Riordan (1988) argued that sustainable development is oriented toward ‘the concept of development’ and sustainability is oriented towards ‘the concept of environment’.

[61] Pearce et at.(1989) also defined two terms related to sustainable development; “economic growth” that means that real GNP per capita is increasing over time. But observation of such a trend does not mean hat growth is

time with free exchange or substitution between natural and man-made capital, or that a set of "development indicators" like per capita utility or well-being is increasing over time subject to non-declining natural wealth.

The term sustainable development was first defined and popularized in 1987, in *Our Common Future* (WCED, 1987), a book published by the World Commission for Environment and Development. The WCED described sustainable development as development that met the needs of present generations without compromising the ability of future generations to meet their needs. Or, as described in their publication it is described as "a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations."

In *Our Common Future,* (Oxford University Press, 1987) the WCED recognized that the achievement of sustainable development could not be simply left to government regulators and policy makers. It recognized that industry had a significant role to play. The authors argued that while corporations have always been the engines for economic development, they needed to be more proactive in balancing this drive with social equity and environmental protection, partly because they have been the cause of some unsustainable conditions, but also because they have access to the resources necessary to address the problems.

Since then, numerous definitions have been proposed for sustainable development (See Table in Gladwin and Kennelly 1995, p. 877). Gladwin and Kennelly (1995) summarize a number of different definitions, which, taken together, establish biological/ ecological, economic and social systems and processes as the three bases of the concept of sustainable development, and suggests that sustainable development is "a process of achieving human development in an *inclusive*[62], *connected*[63], *equitable*[64], *prudent*[65] and *secure*[66] manner." The social aspects of sustainable development are most clearly present in the first three elements, i.e. inclusiveness, connectedness and equity, particularly, Gladwin et al, identify equity as a central dimension of nearly all definitions of sustainable development and all also

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"sustainable", and "sustainable economic growth" means that real GNP per capita is increasing over time and the increase is not threatened by "feedback" either from biophysical impacts (pollution or resource problems) or from social impacts (poverty or social disruption).

[62] Inclusiveness suggests that sustainable development embraces both environmental and human systems, both near and far, in both the present and the future (Gladwin et al. 1995).

[63] Connectivity suggests that a nation cannot reach its economic goals without also achieving social and environmental goals and that social equity and biospheric respect, and enhanced welfare anywhere on the planet (Gladwin et al. 1995).

[64] Equity is considered that the fair distribution of resources and property rights,, both within and between generations, is a central dimension (Gladwin et al. 1995).

[65] Prudence is considered as keeping life-supporting ecosystems and interrelated socioeconomic systems resilient, for avoiding irreversibilities and for keeping the scale and impact of human activities within regenerative and carrying capacities(Gladwin et al. 1995).

[66] Security is aimed at ensuring "a safe, healthy, high quality of life for current and future generations (Gladwin et al. 1995).

have obvious social components (Schaefer, 2004). .

Although proponents of sustainable development focused on the environmental factor in its initial stage, the concept of "sustainable development" has since been expanded to include the consideration of the social dimension as being inseparable from development since the definition of Gladwin et al. In the words of the World Business Council for Sustainable Development (2000, p. 2), sustainable development "requires the integration of social, environmental, and economic considerations to make balanced judgments for the long term."

Wilson (2003) argued that sustainable development is a broad concept in that it combines economics, social justice, environmental science and management, business management, politics and law. It is a dialectical concept in that, like justice, democracy, fairness, and other important societal concepts, it defies a concise analytical definition, although one can often point to examples that illustrate its principles.

These efforts should then also form the bases of any notions of corporate sustainability. That is to say, the problem comes when the corporation has to develop the processes and implement strategies to meet the corporate challenge of corporate sustainability. The concept of sustainable development is "fuzzy, elusive, contestable and/or ideologically controversial" and with multiple objectives and ingredients, complex interdependencies and considerable moral thickness (Gladwin and Kennelly, 1995, p. 876). Thus, Wheeler et al.(2003, p. 17) have stated that sustainable development is "an ideal toward which society and business can continually strive, the way we strive is by creating value, creating outcomes that are consistent with the ideal of sustainability along social environmental and economic dimensions".

Industry's response to the WCED's call came in stages as everyone wrestled with what sustainable development in action should look like. The first serious sign of support came from the International Chamber of Commerce when it issued its *Business Charter for Sustainable Development* in 1990. This was followed in 1992 by the book *Changing Course*, by Stephen Schmidheiny and the Business Council for Sustainable Development (now the World Business Council for Sustainable Development; MIT Press, 1992). Both publications focused on the role of corporations in sustainable development, and the authors argued that supporting sustainable development was as much an economic necessity as it was an environmental and social necessity. Since then, many business leaders and corporations have come forward to show their support for the principles of sustainable development (Wilson, 2003).

Since 1987, many discussions have been conducted in the context of relevance. The discussion started from the limits to growth (John Maynard Keynes, 2002) and the intent of integrating the environment into economic policy (Joan Rivers, 2002) which means that the current economic thinking has striven to take into account environmental issues as the greatest factor for sustainable development. Recently, social issues such as education and poverty have been included as one the great pillars of sustainable

development making the discussion more and more complicated. However, the core of the discussion has been related to the interpretation of terms such as development, needs, and limits which sustainable development contains in its meaning, both explicitly and implicitly. Diversities and complexities of these concepts make it more difficult to understand the concept of sustainable development (Ahn and Lee, 2005). On the contrary, understanding of these terms will be helpful for moving forward more clearly and accurately with the concept of sustainable development.

A point of view regarding the concept of 'development' has been divided into two sides; that is focusing on quantitative growth such as increase of GNP (Truman,1949), or qualitative growth such as human development (Amartya Senm, 1998). The concepts of 'needs' has ranged from environmentalism to poverty according to the period and perspectives. Development in sustainable development focuses on growth regardless of it being quantitative or qualitative.

Joan Rivers (2002) argued that the concept of needs leads to the result of inter-generational equality, and the concept of limits is based on concerns about the inter-generation's equality. Here, 'needs' means 'the essential needs' which cover basic material needs such as food, education health, housing and sanitation, and non-material needs such as fundamental human rights, participation and self-reliance. Therefore, the highest target of essential needs is to meet needs of the world's poor. Namely, the Brundtland report (1987) put meeting the essential needs of the world's poor as an overriding priority. The idea of limitations means that it was imposed by the state of technology and social organization on the environment's ability to meet present and future needs (Rivers, 2002).

In this passage, the crucial elements of sustainable development seem to be identified as 'meeting basic needs', 'recognizing environmental limits', and 'the principle of intergenerational and intragenerational equity' (Rivers, 2002). Basing the discussion on the, 'sustainable' part of 'sustainable development' means 'the idea of, 'development' means that both Sen's qualitative development based on human development and Truman's quantitative growth must be included. To conclude, sustainable development/sustainability should be defined as "a continuous growth meeting the essential needs, covering material needs and non-material needs of human beings as the overriding priority for the needs of the world's poor, based on overcoming the limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs[67].' In order to meet an idea of

[67] Numerous definitions have been proposed for sustainable development (see a review in Gladwin and Kennelly 1995, p. 877). In spite of which, a content analysis of the main definitions suggests that sustainable development is ''a process of achieving human development in an inclusive, connected, equitable, prudent and secure manner.'' (Gladwin and Kennelly 1995, p. 876); The problem comes when the corporation has to develop the processes and implement strategies to meet the corporate challenge of corporate sustainable development. As Wheeler et al. (2003, p. 17) have stated, sustainability is ''an ideal toward which society and business can continually strive; the way we strive is by creating value, creating outcomes that are consistent with the ideal of sustainability along social, environmental and economic dimensions''. However, some suggestions have been proposed to achieve corporate ecological sustainability (Shrivastava, 1995; Stead and Stead, 2000; among others). A pragmatic proposal is to extend the traditional ''bottom line'' accounting, which shows overall net

sustainable development, it "requires the integration of social, environmental, and economic considerations to make balanced judgments for the long term (WBCSD, 2000)."

The contribution of sustainable development to corporate sustainability is summarized as twofold. First, it provides a common human goal for sustainable or continual growth which corporations, governments, and civil society should strive to pursue. Ecological, social, and economic sustainability are presented. Second, it helps set out the areas or directions of the new management paradigm that companies should focus on: environmental, social, and economic performance. However, sustainable development, by itself, does not provide the necessary arguments for why companies should care about these issues. Because a corporation is one of three main bodies in the economic perspective, implicitly it should play a certain role in achieving sustainable development. These arguments come from theories related to environmental management, corporate social responsibility and stakeholder engagement.

4.2.2 Environmental management

1) Evolution of environmental management in its construction and historical perspectives[68]

At the time of the first energy crisis in 1973~1974, Schumacher (1973) put forward that one of the most fateful errors of the generation is the faith that 'the problem of production' has been solved; and the rise of this error is closely connected with the philosophical changes during the last two centuries in man's attitude toward nature. Through pointing out three dangerous illusions of modern industrial society that: (a) unlimited growth is possible in a finite world; (b) there are unlimited numbers of people willing to perform mindless work for modest salaries; and (c) science can be used to solve social problems (Schumacher, 1979), he argued that these illusions are actually the causes of resource depletion, environmental degradation, worker alienation, and violence; and that we are far from being interested in examining the possibilities of alternative methods of production and patterns of living.

In reality, modern industrialization is heavily rooted in the mechanistic industrial paradigm under which organizations are viewed as 'good-directed entities' made of assembled human parts, and the job of manager is to make those parts work together more efficiently, minimizing labor costs and maximizing profits (Stead and Stead, 1992). This paradigm has obviously been applied in large-scale mass production manufacturing organizations. Against the mechanistic paradigm, a new industrial paradigm has been put forward since the 1970s.

Recognized features of the new paradigm are the introduction of new organizational, managerial and

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profitability, to a ''triple bottom line'' that would include economic, social and environmental aspects of corporations. Van Marrewijk and Werre (2003) maintain that corporate sustainability is a custom-made process and each organization should choose its own specific ambition and approach regarding corporate sustainability. This should meet the organization's aims and intentions, and be aligned with the organizational strategy, as an appropriate response to the circumstances in which the organization operates

[68] Based on B.W. Lee (2005, 1997, 1995)

technological practices, which can be said to signify major or revolutionary shifts involving both the products and production processes; the five key features which differentiate it from the mechanistic view include: (a) move from mass to small or customized production; (b) greater emphasis on non-price factors; (c) flexibility in technology; (d) flexibility in organizational structure; and (e) changing relationships between organizations (Meredith, 1994)

In addition, having examined the recognized new industrial paradigm, it is now important to look at the emerging environmental management paradigm, which is legislatively imposed upon companies that still follow mechanistic systems of production, in order to improve their environmental performance. To achieve short-term improvements in the environmental performance of business, managers have to be encouraged to recognize the immediate impacts that their actions can have on environmental quality. However, long-term improvements can only be accomplished through educating and training present and future generations of managers in accordance with a new management paradigm. This would be a recognition that improved environmental performance or the development of innovative clean technologies can provide a competitive advantage that can become a factor in changing corporate behavior. From research evidence (Barratt, 1991; Porter, 1991; Talyor, 1992; Willum and Goluke, 1992), a link can be established between competitive success and environmental performance; and it is now broadly accepted that the strategic environmental management can offer many opportunities for paving a path towards ‘sustainable development’.

Smith (1993), however, indicates that one of the difficulties in addressing environmental issues within business relates to the role of corporate culture and managerial values in affecting the corporate response. He argued that a paradigm shift in the culture of business will be difficult to achieve without the holistic co-operation of stakeholders including managers, shareholders and business educators. A failure to incorporate a new set of environmental values at the heart of the corporate culture will result in a process of simply incubating the environmental crisis which will then re-emerge at a later date. A more fundamental inculcation of true environmental values within business is required.

Codington (1993) put forward the idea that the ecological fate of the world is essentially in the hands of industry and the basic rule of the new paradigm will be environmental innovation on the part of corporations. As Smith (1992) pointed out, however, many of the proposals on corporate approaches to greening have largely been cosmetic and have been more concerned with the short-term marketing advantages that can be obtained through appearing to be ‘green’; many companies remain at the earliest stages of environmental concern. According to Gray et al. (1993), the extremely low level of response to the environmental crises which have been undertaken by business, at large, across the world was confirmed; the present situation consists of a combination of the following:

· Business, as a whole, does not believe in the seriousness of the environmental crisis;
· It does not (or unwilling) see business as part of the problem;

· It is unable or unwilling to take steps to do anything about it.

Even though many companies bear a considerable moral and economic responsibility due to their past, present and planned operations, they practically find it difficult to respond effectively to environmental pressure; it is sometimes hard for them to raise the financial or human resources required to meet the challenge.

The new mood can be exemplified in practice by Edgar S. Woodard, chairman of DuPont, who coined the phrase ‘corporate environmentalism’ in a speech in London in May 1989. By this he meant an attitude and a performance commitment that places corporate environmental stewardship fully in line with public desires and expectations. DuPont believes that an environmental management paradigm shift is under way, so that, rather than regarding environmental quality as an added burden for business, it is now considered a vital part of a company’s competitive advantage. Instead of traditional reactive responses to pollution problems, seeking to comply with regulations and so more, the aim is now to prevent pollution at source and aim for ‘environmental excellence’(Robins and Trisoglio, 1992) Furthermore, Callenbach et al (1993) distinguish between ‘environmental management’ and ‘ecological management’ (or ‘eco-management’). They use the former term to refer to the defensive and reactive approach exemplified by reactive environmental efforts and compliance auditing, and the latter to indicate the proactive and creative approach. The distinction implies the use of ‘ecological’ in that broader and deeper sense (‘deep ecology’) which involves the shift from the dominant mechanistic paradigm to a holistic, systemic worldwide.

The actual pace of change, however, is no doubt much too slow, but there is no way back; it will smooth the shift from today’s paradigm of industrial modernization to what will probably be tomorrow’s paradigm of ecological modernization (Dahle, 1993). Only a complete change of paradigm is likely to allow human beings to become part of the’ environment’ rather than its exploiter; even though it is extremely naïve to expect that the business world – as presently constituted – can or will solve the environmental crises, substantial change in the framework of business management and the intellectual concepts within which business operates is an essential prerequisite for businesses to operate from a more environmentally benign economic system (Gray et al., 1993).

Some researchers have attempted to integrate the biophysical environment into traditional strategic management based upon the premise that corporate sustainable advantage will mainly be influenced by environmental issues in the future and analyze the relationship between corporate environment performance and profitability(Hart, 1995; Russo and Fouts, 1997; Carter et al., 2000; Goldstein, 2002; Aragon-Correa, 2003; Watson et al., 2004 ; Handfield et al., 2005; Wagner, 2005), based on a resource-based view of the firm which has emphasized the firm’s internal compatibilities (Wernerfelt, 1984; Baney, 1991). Previous applications of resource-based theory to evaluation of environmental policies and strategy have concentrated on internal analyses of firms (Porter, 1991; Shrivastava, 1995a).

However, Hart (1995) expanded the resource-based view of the firm to include the constraints imposed and opportunities offered by the biophysical environment (Russo and Fouts, 1997).

2) Definition of Environmental Management from the literature review, until now, a number of scholars in the field of environmental business management have been generally divided into two categories; one is environmental management in a narrow sense, which focuses on the real and concrete function and methods in order to improve corporate environmental performance, the other is more broader environmental management, which tries to interpret and access corporate environmental issues in strategic management perspectives, assuming that corporate environmental issues are highly and directly related to overall corporate activities

Environmental management is narrowly defined as "control and reduction of the firm's harmful impact on environment (T. Wolters et al, 1995)" and "a series of technique and implementation tools which support conversion from end-of-pipe treatment of pollutants to prevention of wastes and pollutant and cleaner production (I. Christie, 1995)". On the other hand, a broader definition is "a series of confrontation activities in environment perspective which develop and implement corporate environmental policy and strategy based on the review regarding its environment of the *'state of the art,*' and also establish effective management systems for continual improvement (R. Gray et al., 1993)" and "the integration of environmental protection into all managerial functions with the aim of reaching an optimum between economic and ecological performance of a company (K. North, 1992)".

Taking these wide range views synthetically into consideration, environmental management should be inclusively defined as "a series of business management activities to pursue simultaneously economic profitability and environmental sustainability in order to improve environmental management performance over the whole process of corporate activities (B.W. Lee, 2005, 1995). The harmonization of economic profitability and environmental sustainability is an ultimate goal which environmental management has pursued, its range of scope includes the whole range of corporate activities from the procurement of raw materials, via production/manufacture, marketing, consumption, to disposal. As well, real and concrete approach methods for achieving the objectives of environmental management should be grouped into the improvement of the whole life of corporate activities. Accordingly, research in the field of environmental management should be designed to develop the practical methodologies in order to achieve the new management goal of harmonizing economic profitability and environmental sustainability; thereby rethinking the traditional management paradigm of pursuing profit-maximization in environmental perspectives(B.W. Lee, 2005).

Environmental management primarily contributes to corporate sustainability by providing strategic environmental management arguments as to why corporate managers should work toward sustainable development. Industrial activities have necessarily led to the environmental pollution of atmosphere,

water, and soil. In this respect, it has strived to integrate and harmonize economics and the environment over the whole life of corporate activities in strategic management perspectives. Another contribution is that it has provided the actual methods for sustainable development, in particular, continual improvement of eco-efficiency, in environmental management perspectives. The key approaches are green procurement and marketing, environmental verification and audit, environmental performance evaluation, environmental labeling, life cycle assessment, and environmental management systems. A number of companies have introduced these methods in order to solve their environmental problems and to achieve a sustainable competitive advantage.

4.2.3 Corporate Social Responsibility (CSR)

CSR is also a broad, dialectical concept. In the most general term, CSR deals with the role of business in society. In many ways CSR can be considered a debate, and what is usually in question is not *whether* corporate managers have an obligation to consider the needs of society, but *the extent to which* they should consider these needs.

As a concept, CSR has been around much longer and more diverse history than sustainable development or the other concepts discussed in this section. Although reference to CSR occurred a number of times prior to the 1950s, that decade ushered in what might be called the 'modern era' with respect to CSR definitions (Carroll, 1999). A 1973 article by Nicholas Ebserstadt traced the history of CSR back to ancient Greece, when governing bodies set out rules of conduct for businessmen and merchants (*Managing Corporate Social Responsibility*, Little, Brown and Company, 1977). The role of business in society has been debated ever since. According to Archie B. Carroll (1979), one of the most prolific authors on CSR, the modern era of CSR began with the publication of the book *Social Responsibilities of the Businessman* by Howard Bowen in 1953. It was proposed that Bowen deserves the appellation of the Father of Corporate Social Responsibility (Carroll, 1991). Since then, many authors have written on the topic. For the first few decades after 1953, the main focus of these writings was whether corporate managers had an ethical responsibility to consider the needs of society

1) Historical perspectives on the evolution of the definition of corporate social responsibility

Corporate social responsibility has recently been the subject of increased academic attention. While social responsibility has figured in commercial life over the centuries, in the modern era increasing pressure has been placed on corporations to play a more explicit role in the welfare of society. Although the topic rose to prominence in the 1970s (Carroll, 1979; Wartick ad Cochran, 1985), the first publication specifically on the field dates back to 1953, with Bowen's "Social responsibilities of the businessman." In this work, Bowen argued that industry has an obligation "to pursue those policies, to make those decisions, or to follow those lines of actions which are desirable in terms of the objectives

and values of society" (Bowen, 1953, p.6[69]). He set the scene in this field by suggesting that the concept of specifically corporate social responsibility emphasizes that:

- businesses exist at the pleasure of society and that their behaviour and methods of operation must fall within the guidelines set by society; and
- businesses act as moral agents within society.

Wood (1991) expanded these ideas, encapsulating them into three driving principles of social responsibility, which are that:

- business is a social institution and thus obliged to use its power responsibly;
- businesses are responsible for the outcomes relating to their areas of involvement with society; and
- Individual managers are moral agents who are obliged to exercise discretion in their decision-making.

In general, the social responsibilities of a firm seem to arise from the intersection (and compatibility) of the political and cultural systems with the economic system (Jones, 1983). However, Friedman (1970) argued that the successful functioning of our society depends on the role specialization of its institutions (or systems). According to him the corporation is an economic institution and thus should specialize in the economic sphere; socially responsible behaviour will be rectified by the market through profits. In Friedman's (1970) view business has only one social responsibility and that is to maximize the profits of its owners (to protect their property rights). Organizations are seen purely as legal entities incapable of value decisions. A manager who uses a firm's resources for non-profit social purposes is thought to be diverting economic efficiency and levying an "illegal tax" on the organization. Opponents (Frederick et al., 1992) of this view, challenge the very foundations of Friedman's thesis - the economic model. They claim that the economic model and role specialization of institutions (or systems) are not working as suggested. This comes as a result of the rise of oligopolies in certain sectors; the separation of ownership and management; government's involvement in the economy and conversely industry's involvement in the political process through lobbying. In addition, if corporations do not adopt "social responsibility", government with its potential for inefficiency and insensitive bureaucratic methods may be forced to step in. With respect to Friedman's argument that the legal conception of corporations' articles and memorandums of associations limits a firm's involvement solely to economic roles, it can be claimed that they are broad enough to allow departures from this narrow path.

Social responsibility is also seen as a consequence of and an obligation following from the unprecedented increase of firms' social power (as tax payers, recruiters, etc.). Failure to balance social power with social responsibility may ultimately result in the loss of this power and a subsequent decline of the firm (Davis, 1975).

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[69] Epstein (1987), however, argues that the concept of specific business ethics can be traced further back to certain academics and businessmen in the nineteenth century who promulgated the belief that "private business is a public trust".

Another school of thought sees social responsibility as a contractual obligation firms have towards society (Donaldson, 1983). It is society in the first place that has permitted firms to use both natural and human resources and has given them the right to perform their productive functions and to attain their power status (Donaldson, 1983). As a result, society has an implicit social contract with the firm. Thus, in return for the right to exploit resources in the production process, society has a claim on the firm and the right to control it. The specifics of this contract may change as social conditions change but this contract, in general, always remains the basis of the legitimacy of the demand for or assertion of the need for CSR (Epstein, 1987).

A growing number of scholars take the view that firms can no longer be seen purely as private institutions but as social institutions instead (Frederick et al., 1992; Freeman, 1984; Lodge, 1977). The benefits flowing from firms need to be shared collectively. This thesis is similar to the stakeholders model (Freeman, 1984) and claims that a firm is responsible not only to its shareholders (owners) but to all stakeholders (consumers, employees, creditors, etc.) whose contribution is necessary for a firm's success. Thus, CSR means that a corporation should be held accountable for all of its actions that affect people, communities and the environment in which those people or communities live (Frederick et al., 1992).

Carroll (1999; 1979) suggests that CSR is defined as the economic, legal, ethical and discretionary demands that society places on business. Similarly, Zanies conceptualized CSR as the degree of "fit" between society's expectations of business and the ethics of business. He argued that CSR is really nothing more than another layer of managerial responsibility resulting from the evolution of capitalism. An interesting twist to the argument is provided by Tuzzolino and Armandi (1981) who provided a motivational theory of organizational social response based on Maslow's hierarchy of needs. CSR is the fulfillment of a firm's "internal and external self-actualization needs" which are located on the top of their organizational needs pyramid. According to this view, firms adopt CSR after they have satisfied three earlier layers of needs (which include: "physiological" or survival needs fulfilled by corporate profits; "safety needs" such as dividend policy, conglomeration and competitive position; and "affiliative needs" such as participation in trade association, lobby groups, etc.). Epstein (1987) attempted to differentiate "business ethics" and CSR and to incorporate them into a strategic process. According to him "business ethics" refer to issues and dilemmas related to the morality of organizational actions or decisions. CSR focuses more on the consequences of organizational actions. He defined CSR as the "discernment of issues, expectations and claims on business organizations regarding the consequences of policies and behaviour on internal and external stakeholders" (Epstein 1987, p. 101). Angelidis and Ibrahim (1993) defined CSR as "corporate social actions whose purpose is to satisfy social needs". They developed an equilibrium theory based on social demand and supply, identifying a set of factors that affects them (social supply and demand). Carroll (1999) argues that the CSR concept

transitioned significantly to alternative themes such as stakeholder theory, business ethics theory, and corporate citizenship[70].

At the same time, many approaches of CSR were addressed in academic societies. According to Goobbels, Votaw and Sethi (1973) considered social responsibility a brilliant term: "It means something, but not always the same thing to everybody". Too often, CSR is regarded as the panacea which will solve the global poverty gap, social exclusion and environmental degradation. The current concepts and definitions are therefore, often biased towards specific interests (Marcel van Marrewijk, 2003). Banerjee (2001, p. 42) also states that CSR is "too broad in its scope to be relevant to organizations" and Henderson (2001, pp. 21~22) argued that "there is no solid and well developed consensus which provides a basis for action." The lack of an "all-embracing definition of CSR" (WBCSD, 2000, p.3) and subsequent diversity and overlap in terminology, definitions and conceptual models hampers academic debate and ongoing research (Goobbels, 2002, p.5).

2) Definition of Corporate Social Responsibility

In the academic literature, different opinions are presented in terms of the basis or scope of CSR and even the very definitions of the term. Furthermore, some theories combine different approaches and use the terminology with different meanings (Garriga and Melé, 2004). This problem is an old one. It was 30 years ago that Votaw wrote: "corporate social responsibility means something, but not always the same thing to everybody. To some it conveys the idea of legal responsibility or liability; to others, it means socially responsible behavior in the ethical sense; to still others, the meaning transmitted is that of 'responsible for' in a casual mode; many simply equate it with a charitable contribution; some take it to mean socially conscious; many of those who embrace it most fervently see it as a mere synonym for legitimacy in the context of belonging or being proper or valid; a few see a sort of fiduciary duty imposing higher standards of behavior on businessmen than on citizens at large". (Votaw, 1972, p.25). As a consequence different aspects of a firm's operations can be seen to come under its sway -

[70] Marsden and Andirof (2001) define corporate citizenship as "understanding and managing a company's wider influence on society for the benefit of the company and society as a whole." However, Elisabet Garriga and Domenec Mele (2004) argued that the term "corporate citizenship" cannot have the same meaning for everybody. Matten et al. (2003) have distinguished three views of "corporate citizenship": (1) a limited view, (2) a view equivalent to CSR and (3) an extended view of corporate citizenship, which is held by them. In the limited view ''corporate citizenship'' is used in a sense quite close to corporate philanthropy, social investment or certain responsibilities assumed towards the local community. The equivalent to CSR view is quite common. Carroll (1999) believes that ''Corporate citizenship'' seems a new conceptualization of the role of business in society and depending on which way it is defined, this notion largely overlaps with other theories on the responsibility of business in society. Finally, in the extended view of corporate citizenship (Matten et al., 2003, Matten and Crane, in press), corporations enter the arena of citizenship at the point of government failure in the protection of citizenship. This view arises from the fact that some corporations have gradually come to replace the most powerful institution in the traditional concept of citizenship, namely government.

depending on the stance one adopts. As has been shown, what can be conceived as "social responsibility" can range from simply maximization of profits (shareholder approach), to satisfaction of social needs (societal approach), fulfillment of a firm's stakeholders' needs (stakeholder approach), finally for achievement of a social equilibrium, etc. - depending on the stance taken. Therefore, its definition can be very different.

The shareholder approach, regarded by Quazi and O'Brien (2000) as the classical view on CSR,, defined CSR as "the social responsibility of business is to increase its profits" (Friedman, 1970, 1962). The shareholder, in pursuit of profit maximization, is the focal point of the company and socially responsible activities don't belong to the domain of the organization but are a major task of governments. Van Marrewijk (2003) argued that this approach can also be interpreted as business enterprises being concerned with CSR "only to the extent that it contributes to the aim of business, which is the creation of long-term value for the owners of the business" (Foley, 2000).

The societal approach, regarded as the broader view on CSR (and not necessarily the contemporary view), argued that companies are responsible to society as a whole, of which they are an integral part. They operate by public consent (license to operate) in order to "serve constructively the needs of society – to the satisfaction."(Van Marrewijk, 2003). This approach is divided into two perspectives according to the connection with business ethics[71]; one is the basis of the premise of an ethical obligation, the other is differentiated from the "business ethics".

The basic premise of the former is that corporate managers have an ethical obligation to consider and address the needs of society, not just to act solely in the interests of the shareholders or their own self-interest. The arguments in favor of corporate managers having an ethical responsibility to society draw from the following four philosophical theories (Wilson, 2003):

- **Social contract theory**: The central tenet of social contract theory is that society consists of a series of explicit and implicit contracts among individuals, organizations, and institutions. These contracts evolved so that exchanges could be made between parties in an environment of trust and harmony. According to social contract theory, corporations, as organizations, enter into these contracts with other members of society, and receive resources, goods, and societal approval to operate in exchange for good behavior.
- **Social justice theory**: Social justice theory, which is a variation (and sometimes a contrasting view) of social contract theory, focuses on fairness and distributive justice-- how, and according to what

[71] Kilcullen and Ohles Kooistra (1999) define business ethics as "the degree of moral obligation that may be ascribed to corporations beyond simple obedience to the laws of the state."(p.158) and Velasquez (2002) was defined as "a kind of science which researches call the moral criterion, and how does it seek for ways to apply the firm's system and structure, and a person who works for a firm well." And, generally speaking, ethics is defined as 'the norms that a community defines and institutionalizes to prevent individuals from pursuing self-interest at the expense of others.

principles, society's goods (here meaning wealth, power, and other intangibles) are distributed amongst the members of society. Proponents of social justice theory argue that a fair society is one in which the needs of all members of society are considered, not just those with power and wealth. As a result, corporate managers need to consider how these goods can be most appropriately distributed in society.

- **Rights theory**: Rights theory, not surprisingly, is concerned with the meaning of rights, including basic human rights and property rights. One argument in rights theory is that property rights should not override human rights. From a CSR perspective, this would mean that while shareholders of a corporation have certain property rights, this does not give them license to override the basic human rights of employees, local community members, and other stakeholders.
- **Deontological theory**: Deontological theory deals with the belief that everyone, including corporate managers, has a moral duty to treat everyone else with respect, including listening and considering their needs. This is sometimes referred to as the "Golden Rule."

Epstein (1987) argued the latter. He attempted to differentiate "business ethics" and CSR and to incorporate them into a strategic process. According to him "business ethics" refer to issues and dilemmas related to the morality of organizational actions or decisions. CSR focuses more on the consequences of organizational actions[72]. He defined CSR as the "discernment of issues, expectations and claims on business organizations regarding the consequences of policies and behavior on internal and external stakeholders" (Epstein 1987, p. 101), and "relation primarily to achieving outcomes from organizational decisions concerning specific issues or problem which (by some normative standard) have beneficial rather than adverse effects on pertinent corporate stakeholders. The normative correctness of the product of corporate action has been the main focus of corporate social responsibility (Epstein 1987, p.104).

The stakeholder approach takes the view that firms can no longer be seen purely as private institutions but as social institutions instead (Frederick et al., 1992; Freeman, 1984; Lodge, 1977) and indicates that organizations are not only accountable to their shareholder's but should also balance a multiplicity of stakeholders interests that can affect or are affected by the achievement of an organization' objectives (Freeman, 1984). Thus, CSR in this approach means that a corporation should be held accountable for any of its actions that affect people, communities and the environment in which

[72] We can identify three major distinctions between the business ethics and corporate social responsibility concepts. First, the former focused primarily on moral reflection by the individual manager, the latter emphasized organizational action. Second, moral reflection, within the business ethics framework, was a more generalized activity applying to the totality of a manager's activities whereas, the corporate social responsibility concept stressed specific issues and problems, identifiable stakeholders, and particular outcomes. Finally, business ethics analyzing business behavior (just, rights, utility, right or wrong, good or bad), while the value concerns inherent in the corporate social responsibility notion were couched in more "objective" social science terminology – power, rationality, and legitimacy (Epstein, 1987).

those people or communities live (Frederick et al., 1992)

There are many different CSR definitions in the academic literature. Each company may choose – from many options – which concept and definition is the best, matching the company's aims and intentions and is most nearly aligned with the company's sustainability strategy, as a response to the circumstances in which it operates. However, when a company chooses its options for CSR, it is better to consider the results of the following;

Schwartz and Dahl observed, at the operational level, that socially acceptable behavior of North American firms at the time of writing in the 1970s included:

· disclosure of information to shareholders;
· disclosure to the board of directors;
· monopolistic behavior (predatory pricing, etc.);
· equality of treatment for minorities;
· profit sharing;
· environmental protection;
· ethics in advertising; and
· social impact of technology.

Carroll (1999) surveyed 50 academic leaders in the social issues in management field. Table 4.1 lists the topics along with the percentage of frequency that these topics were mentioned by the experts as "most important in the 1990s (Carroll, 1994, p. 14)."

Table 4.1 Academic Leaders' Ranking of Importance Research Areas in the Social Issues in strategic management field

Topic/Issue	Percentage Frequency Mentioned
· Business Ethics	21.5
· International social issues	16.1
· Business and society/social issues	10.7
· Corporate Social Performance (CSP)	10.7
· Business and government/public policy	9.8
· Environmental issues	8.9
· Theory/research methods development	6,2
· Issues within corporations	6.2
· Strategic issues	3.6
· Corporate governance	2.7
· Stakeholder	1.8
· Other	1.8

Note: Responses of 50 academic leaders to the question "What topics do you see as most important for research in the social issues in the management field in the balance of the 1990s?" (Carroll, 1994, p.14)

However, Vyarkarnam (1992) argued that many of these have now been regulated by statute. Present day concerns have changed focus. He found that current CSR concerns, which are in substance the same for both North American and the UK firms, encompass such areas as:

· Environmental protection (e.g. reduction of emissions and waste and the recycling of materials);

· Philanthropy (donating to charities, etc.);
· Involvement in social causes (involving anything from human rights to AIDS education);
· Urban investment (working with local government to regenerate small businesses and the inner city and on environment generally); and
· Employee schemes (higher standards of occupational health and safety, good standard of staff treatment, job-sharing, flexi-time, etc.).

In the EU (2002), based on the results of a wide range of surveys CSR responsibilities are described as "companies integrate social and environmental concerns in their business operations and in their interactions with stakeholders on a voluntary basis. The ER's CSR definition has recently brought about a wide range of discussions regarding the right terminology for sustainable development which business society should pursue.

CSR contributes to corporate sustainability by providing the important arguments of the relationship between the corporation and society as to why corporate managers should work toward sustainable development: If society, in general, believes that sustainable development is a worthwhile goal, corporations make a voluntary efforts to help society move in that direction in order to achieve win-win target through the suitable ways based on matching the company's intentions and aligned with the company's strategy. Namely, it presents an insight to harmonize economy and society for sustainable development in strategic management perspectives. Ethics was considered in the area of CSR as a term of 'business ethics' and business ethics can be applied as one of principles for corporate sustainability management. Marrewijk (2003) argued that CSR contributes to re-alignment of the value system and all business elements, such as, mission, vision, policy deployment, decision-making, reporting, corporate affairs, etc. in accordance with societal circumstances thereby, inviting corporations to respond and consequently reconsider their roles within society. As well, he maintained that CSR contributes to change the management style to become more socially relevant; this helps to create organizations, which continue to improve their scope by expanding the management scope to the employees and the suppliers, and helps them to form an important triangular relationship with the State and the Civil Society.

4.2.4 Stakeholder Management

Recently, a number of firms have been pressured to make improvements by non-governmental organizations (NGOs), activists, communities, governments, media and other institutional forces. These groups have demanded what they consider to be responsible corporate practices. Now, many firms are making corporate responses to social demands by establishing dialogue with a wide spectrum of stakeholders. This means that firms' stakeholders have emerged as one of the key risk factors in strategic management. The relationship with firms' stakeholders is highly crucial for corporate

sustainability. In fact, stakeholder dialogue[73] helps the corporation to address the question of responsiveness to the generally unclear signals received from the environment. In addition, this dialogue "not only enhances a company's sensitivity to its environment but also increases their understanding of the environmental challenges that the organization must address (Kaptein and Van Tulder, 2003 p. 208). Accordingly, this dissertation author reviewed the evolution of stakeholder management and finally defined stakeholder management in sustainability perspectives.

1) Evolution of Stakeholder Management definition construct: Historical perspectives

The idea that companies have stakeholders has now become commonplace in both academic and professional management literature. In academic perspectives, the publication of R. Edward Freeman's book, *Strategic Management: A Stakeholder Approach* (Pitman Books, Boston, Mass, 1984), has catalyzed a dozen books and numerous articles with primary emphasis on the stakeholder concept. From the industry's side, together with the emergence of corporate sustainability for human beings, the importance has primarily emphasized the relationships between the company and a wide range of stakeholders such as suppliers, employees, stockholders, and local community.

Stakeholder theory sprang out of a maelstrom of "affairs" in 1967; community groups in the USA invited themselves to an Eastman Kodak AGM against a backdrop of racial tension and mass unemployment among Greater Cleveland's black population. In the USA again, consumer organizations invited themselves to a General Motors' 1970 AGM to complain about safety defects on the cars being sold and to ask other questions about social practices (Lépineux, 2003). Its real academic development started only at the end of 1970s (see, e.g., Sturdivant, 1979). In a seminal paper, Emshoff and Freeman (1978) presented two basic principles, which underpin stakeholder management, and Freeman (1984) presented the stakeholder concept and model of the relationship between corporation and stakeholders.

Since 1984, a great deal of conceptual and empirical research has been done, guided by a sense of pragmatism. As empirical research studies, the following authors present strategies for how to select the best practices in corporate stakeholder relations (Bendhein et al., 1998), stakeholder salience to managers (Agle and Mitchell, 1999; Mitchell et al., 1997), the impact of stakeholder management on financial performance (Berman et al., 1999), the influence of stakeholder network structural relations (Rowley, 1997) and how managers can successfully balance the competing demands of various stakeholder groups (Ogend and Watson, 1999). Significant examples of the stakeholder concept include articles by Brenner & Cochran (1991), Hill & Jones (1992), Wood (1991 a, b), Donaldson and Preston (1999; 1995), Jones and Wicks (1999), Mecier (1999), Lépineux (2003), Pesqueux and Damak-Ayaldi (2005) and numerous papers by Freeman (1999; 1994). According to Donaldson and Preston (1995), more than 100 articles and a dozen books have been devoted to this topic, with most having been

[73] In other words, stakeholder engagement or stakeholder involvement has also been used in professional societies.

published in reviews like *Business Ethics Quarterly* and *Academy of Management Review*.

According to Presqueux and Damak-Ayadi (2005), stakeholder theory should postulate the following:

- An organization will maintain relationships with several groups that affect or are affected by its decisions (Freeman, 1984).
- Theory will be dependent on the nature of such relationships because of the way in which the processes involved, and the outcomes achieved can affect society and stakeholders.
- Stakeholders' interests have some intrinsic value, but no one interest should be able to dominate all of the others (Clarkson, 1995; Donaldson and Preston, 1995).
- Theory is interested in managerial decisions (Donaldson and Preston, 1995).

They (2005) also argued that stakeholder theory has two variants in regards to corporate social responsibility; the first relates to the empirical nature of responsibility. Theory here is based on the idea that an organization's interests are the first to be taken into account, and that its subsequent efforts are then "divided" up among its various stakeholders in a way reflecting their respective levels of importance. Here information is seen as a crucial element allowing the organization to "manage" its relationships; at the very least to avoid stakeholder opposition; and where possible to gain their adherence. The second relates to the organization-stakeholders relation, conceived of as a social relationship implying the genesis of an organization's responsibility to its stakeholders. This is a normative approach to responsibility.

Donaldson and Preston (1995) offered a taxonomy of the different stakeholder theories by placing them into three separate categories (category 1, normative; category 2, empirical and instrumental; category 3, empirical and descriptive). Jones and Wick (1999) think that this typology helps to delineate stakeholder theory's two founding schools: the empirical stakeholder theory (based on descriptive and instrumental perspectives); the normative theory (based on ethics). The following explains stakeholder theory's main schools.

- **Descriptive stakeholder theory (Donaldson and Preston, 1995)**: They consider that an organization is what one finds at the center of cooperation and competition situations, each of which possesses its own intrinsic value. This descriptive approach only allows for exploratory propositions, however. It does not enable any connection to be made between stakeholder management and traditional business objective (growth, earnings. etc.).
- **Instrumental stakeholder theory (Jones, 1995):** The main idea is that everything else being equal, firms that practice stakeholder management will perform better in profitability, stability and growth than companies that do not do so. One accepts that "certain" results can be obtained if "certain" behaviors are adopted. In other words, the instrumental theory is a contingent one (meaning that it involves reliance on certain types of behavior).

- **Normative stakeholder theory (Donaldson and Preston, 1995):** They highlight the normative bases of stakeholder theory. This perspective is distinct from the functionalism found in empirical theory. Instead of compiling data and using ad hoc quantitative methods to test hypotheses, the focus is on normative outcomes, hence on specifying the moral obligations found beneath stakeholders' positions. What the various approaches of this kind have in common is the fact that they treat stakeholders both as an end and also as having interests that possess intrinsic value.

2) Definition of Stakeholder Management

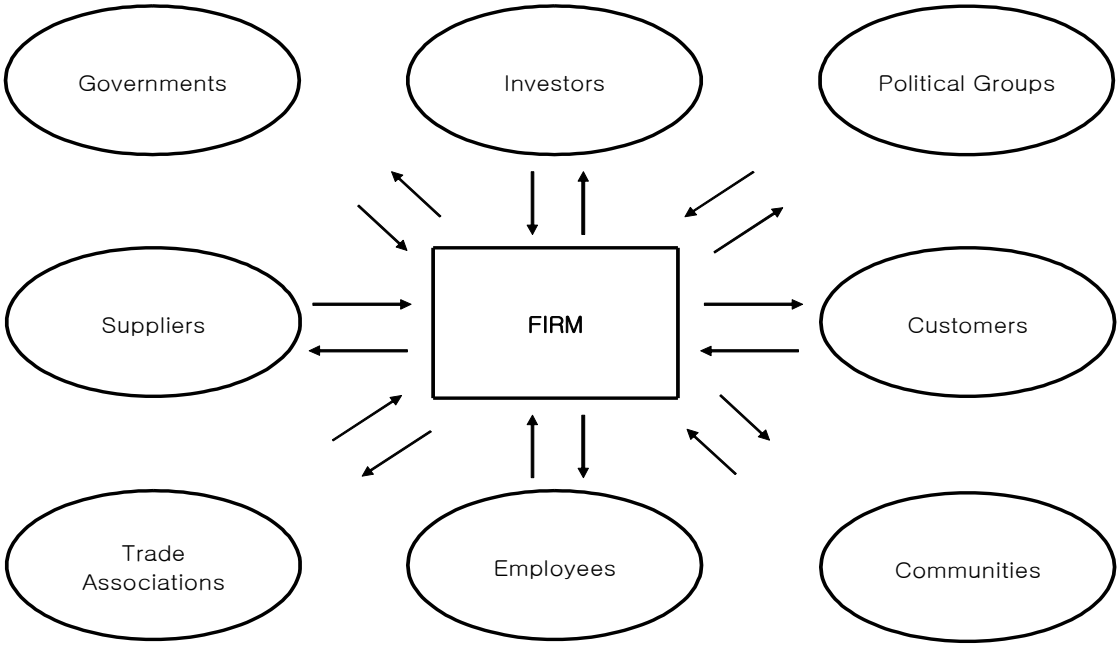
The basic premise of stakeholder theory is that the stronger your relationships are with other external parties, the easier it will be to meet your corporate business objectives; the worse your relationships, the harder it will be. Strong relationships with stakeholders are those based on trust, respect, and cooperation. The goal of stakeholder theory is to help corporations strengthen relationships with external groups in order to develop a competitive advantage (Garriga and Melé, 2004).

In combination with the stakeholder theory, according to ethical considerations, the definition of stakeholders should be divided into two categories; that is one that is based on the empirical stakeholder theory, stakeholders are defined as "any group or individual that can affect or be affected by the realization of a company's objectives" (Freeman, 1984), and "all of the agents for whom the firm's development and good health are of prime concern" (Morcier, 1999). The other is that, based on the normative aspects or ethical considerations, stakeholders are defined by their legitimate interest in an organization. It is based on the idea that we are all stakeholders (Donaldson and Preston, 1995)[74].

Based on the stakeholder concept, each stakeholder of the firm expects to receive appropriate compensation through the relationship. Shareholders and investors want optimum return on their investments; employees want safe workplaces, competitive salaries and job security; customers want quality goods and services at fair prices; local communities want community investment; regulators want full compliance with applicable regulations. However, there is a general acknowledgement that the goals of economic profitability/ stability, environmental soundness/protection, and social responsibility/ justice are common across many stakeholder groups. Few groups would argue against these goals, although they may debate the level of priority or urgency. The following figure 4.1 show the input-output stakeholder model which the arrows between the firm and its stakeholder constituents run in both directions (Donaldson and Preston, 1995)

[74] This implies that (a) claimants are groups or persons with legitimate interests; that they are known; and that they have been identified; (b) all stakeholder groups' interests have at least a modicum of intrinsic value.

Figure 4.1 Stakeholder Model



Source: Donaldson and Preston (1995)

Stakeholder management is defined as “integration of groups with a stake in the firm into managerial decision-making.” According to Emshoff and Freeman (1978), two basic principles are for stakeholder management. The first is that the central goal is to achieve maximum overall cooperation among the entire system of stakeholder groups and the objectives of the corporation. The second states that the most efficient strategies for managing stakeholder relations involve efforts, which simultaneously deal with issues affecting multiple stakeholders. The following are methods for integration of stakeholders into managerial decision-making.

One of the first challenges for companies is to identify their stakeholders. There appears to be general agreement among companies that certain groups are stakeholders - shareholders and investors, employees, customers, and suppliers. Beyond these, however, it becomes more challenging because there are no clear criteria for defining stakeholders. Most authors agree that if the term 'stakeholder' is to be meaningful, there must be some way of separating stakeholders from non-stakeholders. Some authors have suggested that stakeholders are those that have a stake in the company's activities - something at risk. Other authors have suggested that if you consider the global impacts of industry - such as climate change or cultural changes due to marketing and advertising - everyone is a stakeholder. The issue of qualifying criteria for stakeholder status is currently being debated. Assuming that the main stakeholders have been identified, the next challenge for corporate managers is to develop strategies for dealing with

them. This is a challenge because different stakeholder groups can, and often do, have different goals, priorities, and demands (Wilson, 2003).

The contribution of stakeholder theories and management to the corporate sustainability is the addition of business arguments as to why companies should work toward sustainable development. Unlike the argument of Friedman (1970), stakeholder theory extends the firm's responsibility to include a wide range of actors with an interest or "stake" in the firm – the shareholders themselves, managers, employees and workers, suppliers, customers, interest groups, unions, competitor and so on, broadening out via the local community to society in general and, eventually, the whole world(Argandona, 1998). It suggests that it is in the company's own best economic interest to work in this direction because doing so will strengthen its relationship with stakeholders, which in turn will help the company meet its business objectives. Therefore, the firm should establish the guidelines for the compensation of each stakeholder. This might contribute greatly to a good relationship with stakeholders, the firm's continual improvement and ultimately sustainable development.

4.2.5 Corporate Accountability

Over many decades, the duties placed on companies and expectations of how they should behave have been a topic for public debate. From the end of slavery to health and safety standards, corporations have been required to act in ways deemed to be in a wider public interest. Recent progress on corporate accountability has been dominated by the development of voluntary initiatives initiated by international organizations. The UN Global Compact was established to create a process to support the voluntary socially responsible behavior of corporations. The OECD has recently revised its established mechanism, "the OECD Guidelines for Multinational Enterprises." "The European Code of Conduct for European Enterprises Operating in Developing Countries," is an additional voluntary approach which incorporates a platform for public airing of cases. Many other bodies and industry groups have devised sectoral codes of conduct.

Accountability is a complex, abstract and elusive concept (Sinclair, 1995) which has many alternative definitions (Demirag et al., 2004). Gray and Jenkins (1993) are defined as "an obligation to present an account of and answer for the execution of responsibilities to those who are entrusted with those responsibilities," and Demirag et al. (2004) defined it in its wider sense as "the management of expectations of various stakeholders, often with diverse and conflicting objectives." Demirag et al. also argue that accountability itself takes various forms including communal, contractual, managerial and parliamentary (Sinclair 1995)[75].

- The communal accountability process involves meeting stakeholders' needs through consultation and seeking their involvement in the decision-making process.

[75] Sinclair (1995) presents five forms of accountability: political, public, managerial, professional and personal.

- The contractual accountability process involves entering into a legally binding agreement over standards of performance by laying them down in writing and in specific enforceable terms. It involves the creation of liabilities and obligation to comply through the judicial process (Dubnick, 1998).
- Managerial accountability is the process of making 'those with delegated authority answerable for producing outputs or the use of resources to achieve certain ends'(Sinclair, 1995). These relate to internal structures that are set up to implement, monitor and evaluate programs.
- Parliamentary accountability is the process of holding government executives to account for the policies they have pursued.

Based on the wide range of types, The Friends of the Earth International[76] (2003) argues that governments should collaborate to establish effective international and national law on corporate accountability, liability, and transparency. It believes that new rules must spell out corporations' accountability to their stakeholders including shareholders[77]. It believes "accountability is the legal or ethical responsibility to provide an account or reckoning of the actions for which one is held responsible (Wilson, 2003)."

Some others argue that accountability should be differentiated as one form of responsibility (Thynne & Goldring, 1981; Harmon & Mayer, 1986). Based on these discussions, FoEI (2002) and Wilson (2003) argue; that accountability differs from responsibility in that the latter refers to one's duty to act in a certain way, whereas accountability refers to one's duty to explain, justify, or report on his or her actions.

In business circles, there are many different accountability relationships, but the relevant one, in the context of this dissertation, is the relationship between corporate management and stakeholders. It is based on the fiduciary model, which in turn is based on agency theory and agency law, wherein corporate management is the 'agent' and the shareholders the 'principal'. This relationship can be viewed as a contract in which the principal entrusts the agent with capital and the agent is responsible for using that capital in the principal's best interest. The agent is also held accountable by the principal for how

[76] Friends of the Earth International (FoEI) are a federation of autonomous environmental organizations from all over the world. Our 1.5 million members and supporters in 70 countries campaign on the most urgent environmental and social issues of our day, while simultaneously catalyzing a shift toward sustainable societies

[77] FoEI (2002) argues that, for the objectives of corporate accountability, the convention must:
- establish mechanisms for adversely affected stakeholders to obtain redress through exercising rights;
- establish social and environmental duties for corporations;
- establish rules for consistent, high standards of behavior of corporations;
- create a market framework in which progressive companies can thrive, and governments respond fairly to the demands of their citizens rather than to the lobbying of corporations;
- establish sanctions;
- ensure the ecological debt owed by corporations to the South is repaid; and
- secure environmental justice for communities threatened with or exposed to environmental injustice - north and south.

that capital is used and the return on the investment.

Corporate accountability need not be restricted to the traditional fiduciary model, nor only to the relationship between corporate management and shareholders. Companies enter into contracts (both explicit and implicit) with other stakeholders as a matter of everyday business, and these contractual arrangements can serve as the basis for accountability relationships. For example, companies that receive environmental permits and approvals from regulators to operate facilities are often held accountable by the regulators for whether the terms of the approval are being met. Proponents of social contract theory often argue that corporations are given a 'license to operate' by society in exchange for good behavior, and as such the corporations should be accountable to society for their performance (Wilson, 2003).

The contribution of corporate accountability theory to corporate sustainability is that it helps define the nature or basis of the relationship between corporate management and the expectation of all the stakeholders of society. Corporate accountability tells why CSM should be transparent and objective. This kind of concept might be a basis of the arguments as to why companies should report and be verified by third-party organizations on their environmental, social, and economic performance, not just financial performance, and have a sincere concern for corporate governance in a transparent and objective direction. John Elkington, of the UK consultancy (1997) SustainAbility, called this type of accounting on environmental, social, and economic performance, 'triple bottom line' reporting.

4.2.6 Definition of Corporate Sustainability Management and its three key dimensions.

CSM is a new and evolving corporate management paradigm. It should be integrated and pursued based on strategic thinking[78] for achieving sustainable competitive advantage in strategic management perspectives. However, before a firm integrates the sustainability concept into corporate strategy, it is essential to understand the concept of 'strategic management' and two points of views, namely, contract obligation to shareholders and covenantal obligation to stakeholders, regarding the goals of a firm, whether it is suitable for strategic management as a new corporate management paradigm.

The understanding of management, strategy and strategic management

First, the concept of management should be defined. It means to 'control and organize a business or other organization' in a dictionary. What is important in this meaning is that strategic thinking must be embodied in management. The next thing to understand is the concept of 'strategy'. It is defined as: 'the determination of the basic long term goals and objectives, and the adoption of courses of action and the

[78] Strategic thinking consists of five elements; ***systems perspective, intent-focused***, ***intelligent opportunism, thinking in time, hypothesis-driven***.(Liedka, 1998; Mintzberg, 1994)

allocation of resources necessary for carrying out goals… (Chandler, 1962)', 'the pattern of decisions in a company that determines and reveals its objectives, purposes, or goals, produces the principal policies and plans for achieving those goals, and defines the range of business the company is to pursue, the kind of economic and human organization it is or intends to be, and the nature of the economic and non-economic contribution it intends to make to its shareholders, employees, customers, and communities(Andrews, 1980), and 'a statistical decision rule for deciding which particular pure strategy[79] the firm should select in a particular situation[80] (H. Igor Ansoff, 1968)'.

In this regard, strategic management is defined as "decision-making which creates and maintains competitive advantage by efficient distribution of scarce management resources, and a way which finally maintain firm's existence in the competitiveness of business circles (Jang, 2003)." The most crucial phrase in the definition is to distribute scarce management resources efficiently; that is to say, a firm has taken efforts to distribute its limited resources efficiently, in order to create and maintain competitive advantage or sustainable competitive advantage. If management resources are enough or unlimited, then strategy in business circles is not discussed anymore. Moreover, strategic management generally postulates 'the state of the competitiveness' in business circles. Thus, without competitiveness in the market, the argument regarding strategy in management is meaningless. As a result, strategic decision-making contains 'choice' and 'abandonment (or focus)' of a wide range of options among many cases so as to create and maintain competitive advantage by efficient distribution of scarce management resources. If a firm chooses a certain direction for acquiring and maintaining (sustainable) competitive advantage, much of its management resources need to be committed to (or focused on) achieving those objectives and strategic options.

The understanding regarding the purpose of the corporation

The understanding regarding the purpose of a corporation may have a great influence on the objectives, scope, priorities and direction of the strategy for corporate sustainability. According to Shin (2003), the perspectives regarding the purpose of the corporation have been divided into two categories; contractual obligations to shareholders and covenantal obligations to stakeholders. The latter should be divided into theological perspective (Max Stackhouse), social perspective (Eric Mount, Jr.), and consumer perspective (Laura Nash).

Friedman (1970), who is a well-known representative of the so-called 'contractual obligation of corporations to shareholders' approach, argued that "the only responsibility of business towards society is the maximization of profits to the shareholders within the legal framework and the ethical custom of the country." According to him, profit provides the incentive of the investment to the investor, the

[79] Defined as a move or a specific series of moves by a firm, such as a product development program in which successive products and markets are clearly delineated (H. Igor, Ansoff, 1968).
[80] It was titled as 'a grand or mixed strategy' (H. Igor, Ansoff, 1968).

incentive of efficient production of goods and services to a firm's managers and employees and, as a result, a firm can contribute to the return to the whole society. In this regard, the purpose of the firm is unlike that of other social organizations such as churches, schools, hospitals and so on.

Researchers (Stackhouse, Mount, Nash, etc.) advocated a covenantal obligation to stakeholders argued that the goal of the firm is not to make profit; that is to say, the aim of the firm is to grow and, consequently, achieve a basic goal of 'service to the society'. Therefore, a firm's goal should be extended to include responsibility to a wide range of stakeholders such as various social organizations, consumers and so on (Shin, 2003). According to Shin, several researchers argued in favor of a strong covenantal obligation where a firm is like a church or social service institute.

Whether one is looking at contractual perspectives or covenantal perspectives, profit is the important factor (expressed in terms such as aims, means, responsibility of a firm etc.) in order to achieve continual improvement. Both sides also have a similar position that capital cost, at least, should be compensated by business activities. If not, a firm wastes human and natural resources and is irresponsible to society. Both perspectives put forward emphasis that financial performance is crucial factor for its survival. In addition, the process and products of a firm have had a good or bad influence on employees, customers, and the community (Ahn & Lee, 2005). The relationship between a firm and society has become closer and, accordingly, a firm should consider the perspectives of multiple stakeholders including shareholders in its decision making process (Clarkson, 1996a; Donaldson and Preston, 1995; Jones, 1995; Mitchell, Agle and Wood, 1995; Wood and Jones, 1995).

Table 4.2 presents the relationship between the four pillars of environmental management, corporate social responsibility, stakeholder management, and corporate accountability for CSM.

Table 4.2 Relationship between four pillars for CSM and the concept of core terminologies

	Perspectives & Scope	Sustainability[1]	Goal of a firm	Strategic Management
Environmental Management	Economic & Environment	Necessary & Sufficient Condition	Contractual	Conformity
Corporate Social Responsibility	Economic & Society including ethics	Necessary Condition	Contractual/ Covenantal	Neutrality
Corporate Citizenship	Economic & Society	Necessary Condition	Contractual/ Covenantal	Neutrality
Business Ethics	Economic & Ethics	Necessary Condition	Covenantal	Non Conformity (Normative)
Stakeholder Management	Concern of Stakeholders: Economy, Environment, Society including ethics(Based on "Normative Ethical Theory")	Necessary Condition	Contractual/ Covenantal	Conformity
Corporate Accountability	Transparency & Objectiveness, ethics	Necessary Condition	Covenantal	Non Conformity (Normative)

Note: [1] Necessity condition mainly considers 'the concept of sustainable' and sufficient condition mainly considers 'the concept of development in the mean of sustainability or sustainable development.
[2] Nonconformity (or Normative) means that it is not an object of (strategic) management, but it is the basic principle which a firm should comply with regardless of any circumstances of the business.
Source: Revised from Ahn & Lee (2005)

Definition of Corporate Sustainability Management

CSM is a new and evolving corporate management paradigm. Although the concept encompasses the need for profitability, it differs from the traditional growth and profit-maximization model in that it places a much greater emphasis on economic, environmental, and social performance, and transparency on this performance

CSM borrows elements from five other concepts. Sustainable development sets out the performance areas that companies should focus on, and also contributes the vision and societal goals that the corporation should work toward, namely environmental soundness and protection, social justice and equity (responsibility), and economic prosperity/growth/development. The following are stated concisely in order of the contribution of the five concepts for corporate sustainability.

- Sustainable development/Sustainability contributes to provide a common human goal or value for sustainable or continual growth and sets out the areas or directions of a new management paradigm that companies should focus on: economic, environmental, and social performance.
- The main contribution of environmental management is to integrate and harmonize the economy and environment over the whole life of corporate activities in strategic management perspectives.
- The main contribution of (corporate) social responsibility is to integrate and harmonize the economy and society in strategic management perspectives. Based on one CSR theory or approach, ethics has been included into strategic management as a term of 'business ethics', and business ethics has been applied for business circles in the world as a principle for corporate sustainability.
- The main contribution of stakeholder management extends the firm's strategic management to include a wide range of actors with an interest or "stake" in the firm – the shareholders themselves, managers, employees and workers, suppliers, customers, interest groups, unions, competitor and so on, broadening out via the local community to society in general and, eventually, the whole world.
- The main contribution of corporate accountability to corporate sustainability is that it helps define the nature or basis of the relationship between corporate management and the expectation of all the stakeholders of society. That is to say, corporate accountability tells why corporate sustainability should be transparent and objective.

The contributions and the relationships of these five concepts are illustrated in Table 4.3 and Figure 4.2. In particular, Table 4.3 includes the linkage between five pillars for CSM and the PDCA cycle. It is helpful to understand the framework of strategic sustainability management depicted in figure 4.8.

Table 4.3 Evolution of Corporate Sustainability

PDCA Cycle Perspective	Discipline/Theory	Underlying Concept	Analogous terminologies	Measuring-up	Contribution to Corporate Sustainability
Plan	Economics Ecology Sociology	Sustainable Development	Sustainability	-	Boundaries of the subject matter, description of a common human-being's goal, direction of corporate sustainability management
Plan / mainly Do	Environmental Management Theory	Environmental management	Pollution Prevention, Factor X, Cleaner Production	Eco-Efficiency	Environmental and economical argument as to why corporations should work towards sustainability goals
Plan / mainly Do	Corporate Social Responsibility Theory	(Corporate) Social Responsibility	Corporate Citizenship Business Ethics	Social-Efficiency	Social and economical argument and ethical arguments as to why corporations should work towards sustainability goals
Plan / Do / Check	Stakeholder Theory	Stakeholder Management	Stakeholder Involvement or Stakeholder Engagement	Social-Efficiency	Business argument as to why corporations should consider towards sustainability goals
Check / Act	Corporate Accountability Theory	(Corporate) Accountability		Assurance or not (4 level)[81]	Transparent and objective arguments as to why corporations should report and verify on sustainability performance

Van Marrewijk and Werre (2003) argued that, citing the concept of corporate social responsibility defined by the EU (2002) (See 4.2.3) as the definition of corporate sustainability[82], this is the broad – some would say "vague" and a one-solution-fits-all concept of corporate sustainability that is not reasonable and therefore, the definition for CS and CSR should be abandoned. They also accept more specific definitions which match the development, awareness and ambition levels of organizations. They (2003) argued that individuals and groups (organizations) should choose their own specific ambition and approach regarding corporate sustainability, matching individuals' and groups' (organizations')

[81] According to ISAE (International Standard on Assurance Engagement) 3000, CSM activities should be verified by third parities; the results should be measured according to the four levels suggested by ISAE 3000 (2005.1) such as 'reasonable (highly) assurance, limited assurance, agreed upon the procedure, and compilation (The last two level are not assurance.).

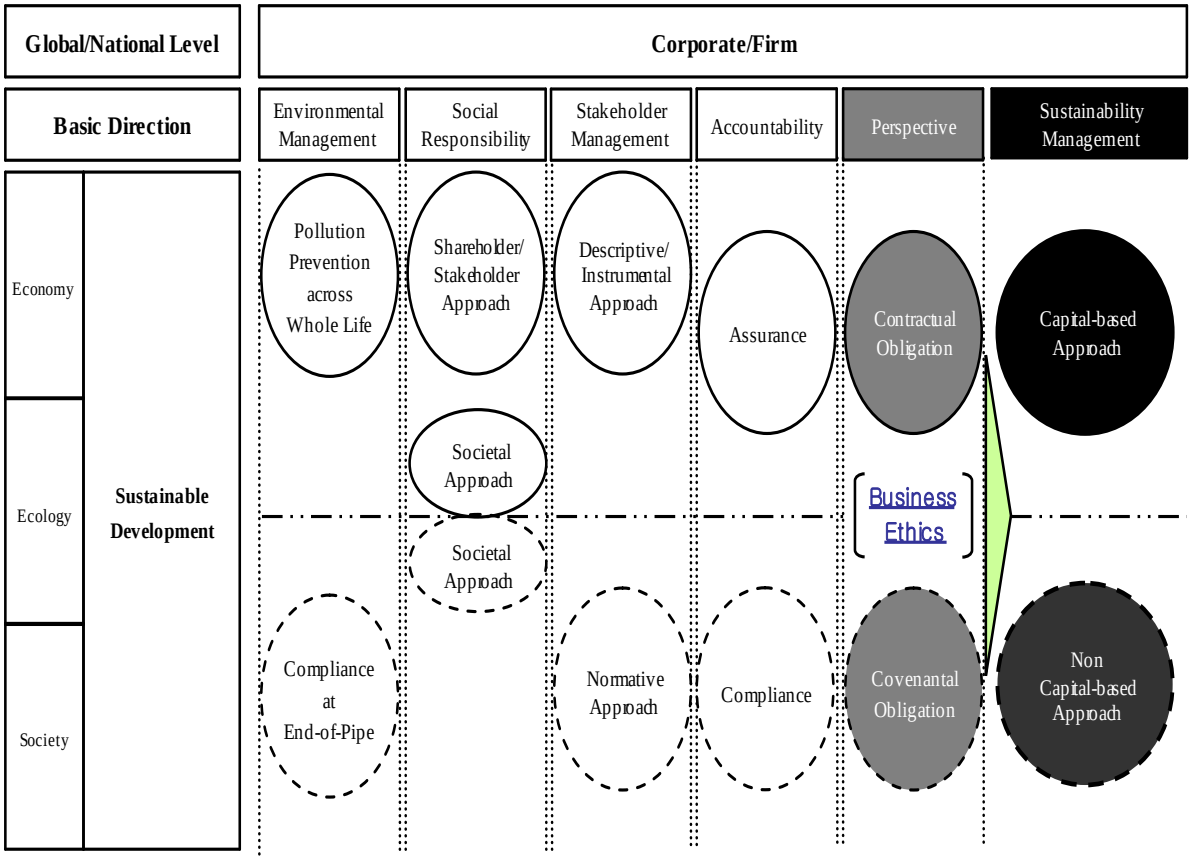
·The objective of a reasonable assurance is a reduction in assurance engagement risk to an acceptably low level in the circumstances of the engagement as the basis for a positive form of expression of the practitioner's conclusion.

·The objective of a limited assurance is a reduction in assurance engagement risk to a level that is acceptable in the circumstances of the engagement, but where that risk is greater than for a reasonable assurance, as the basis for a negative form of expression of the practitioner's conclusion.

[82] Corporate Sustainability refers to a company's activities – voluntary by definition – demonstrating the inclusion of social and environmental concerns in business operations and interactions with stakeholders

aims and intentions and aligned with the their strategy, as an appropriate response to the circumstances in which it operates, and should develop and apply values and supporting institutional structures, in order to cope with the prevailing management risks. Based on this philosophy, they described corporate sustainability as "a custom-made process and each organization should choose its own specific ambition and approach regarding corporate sustainability. This should meet the organization's aims and intentions, and be aligned with the organization strategy, as an appropriate response to the circumstances in which the organization operates. Corporate sustainability determined by conformity or compliance to rules, regulations and procedures; a drive for profit; expressing community values, manifesting a synergetic approach resulting in win-win solutions and CS interpreted in a holistic approach (See Table Ⅴ in Van Marrewijk and Were 2003, pp. 115~116)

Figure 4.2 Relationship of terms related to corporate sustainability management



The author of this dissertation supports Marrewijk and Were's view regarding corporate sustainability from strategic management perspectives; that is to say, corporate ambition levels should reflect the different motivations for incorporating corporate sustainability into business practices. However, considering a wide range of terminologies related to corporate sustainability, particularly the meaning of sustainable development, the perspectives regarding the goal of the firm, and the concept of strategic management, the concept of corporate sustainability or corporate sustainability management should be

defined in order to integrate sustainability into business practices in strategic management perspectives. It should also strive to achieve continual improvement based on the minimization of trial and error or risks that happen in the course of dialogue or communication with a wide range of stakeholders; this is often due to the ambiguity of the firm's goals or how strategic management is defined.

At the same time, in order to transpose the idea of sustainable development (See the 4.3.2 section in this chapter) to the business level, corporate sustainability has been defined by a number of eminent researchers in this area as follows:

- **John Elkington (1997, 1994**) of the consultancy, defined sustainability as "a situation where companies harmonize their efforts in order to be economically viable, environmentally sound and socially responsible, or a framework for measuring and reporting corporate performance against economic, social, environmental parameters"
- **SAM DJSI (1997)**, a prominent sustainability rating institute, defined sustainability as "a business approach that creates long-term shareholder value by embracing opportunities and managing risks deriving from economic, environmental and social developments."
- **Hockerts (1999)** defined sustainability as "any state of a business in which it meets the needs of its stakeholders without compromising its ability also to meet their needs in the future. A company has to ensure that its operations are sustainable in regard to its economic, social and environmental performance."
- **Dyllick and Hockerts(2002)** revised Hockerts' definition to "meeting the needs of a firm's direct and indirect stakeholders (such as shareholders, employees, clients, pressure groups, communities etc), without compromising its ability to meet the needs of future stakeholders as well. Towards this goal, firms have to maintain and grow their economic, social and environmental capital base while actively contributing to sustainability in the political domain." From this definition, they presented three key elements of corporate sustainability identified as: (1) integrating the economic, ecological and social aspects in a 'triple-bottom line', (2) integrating the short-term and long-term aspects, (3) consuming income, not capital.
- **Hart and Milstein (2003)** defined sustainable enterprise as "one that contributes to sustainable development by delivering simultaneously economic social, and environmental benefits – the so-called triple bottom line.
- **Caldelli and Luisa Parmigiani (2004)** generally defined it as "the activities, demonstrating the inclusion of social and environmental aspects in the normal business operations of a company and in its interaction with its stakeholders." The approach to corporate sustainability implies integration of criteria of economic, the social and environmental performance (referring to the triple bottom line: people, planet, profit) in company's decision-making process. To the above aspects, we add a fourth dimension, that of principles: every firm is, by definition, guided by a system of values, which determines its context and orientation. In answer to growing social, environmental and economic pressures on the part of stakeholders, firms are adopting a higher level of transparency.
- **Ahn & Lee (2005)** defined it as "a kind of corporate management which pursues the continual improvement or growth of Return on Investment(ROI) measured and evaluated systematically or

harmoniously in whole business management life from economic integrity, environmental soundness, and social responsibility perspectives"

Various definitions of corporate sustainability and the concept of five pillars such as sustainable development, environmental management, corporate social responsibility, stakeholder management, and corporate accountability related to corporate sustainability provide the following common characteristics:

- Main body: Firm or Enterprise; therefore, corporate sustainability should be applied based on strategic management perspectives;
- Purpose: Achievement of sustainable development through 'Return on Investment (equity)' of economic capital, natural or environmental capital, social capital;
- Scope: the whole life of business management and processes from economical sustainability, ecological sustainability, and social sustainability perspectives;
- Basic principle: Compliance with requirements and transparency;
- How: Integrating or harmonizing, "beyond the compliance", economic factors, ecological factors, and social factors efficiently in order to attain sustainable competitive advantage;
- For whom: direct and indirect stakeholders related to the operation of the company.

This dissertation, considering its theoretical perspective and the concept of corporate sustainability defined in this section, posits that the firm's covenantal obligation to stakeholders, includes its ethical obligation to address the needs of society for corporate social responsibility, and the stakeholder's approach based on normative base should be excluded. If so, corporate sustainability management is possible for sustainable development. Thus, the definition of corporate sustainability (management) in this dissertation is defined as:

A management strategy that pursues continual improvement or increase of "return on investment" of economic capital, natural or environmental capital, and social capital, is measured and evaluated systematically throughout the whole business management life, without compromising the firm's ability to meet the needs of the present and future (direct and indirect) or stakeholders (such as shareholders, employees, clients, pressure groups, communities etc), in such a way that it seeks to go beyond compliance.

Corporate sustainability management implies a much broader interpretation of the concept of capital than is used normally by either economists or ecologists. T. Dyllick and K.Hockerts (2002) argued that three different types of capital – economic, natural, and social – within the triple bottom line of corporate sustainability have different properties and thus, require different approaches. The author of this dissertation supports this argument and understands that the triple bottom line of corporate sustainability should be considered as capital in strategic management perspectives. The following explain the meaning and concepts of three capitals composed of corporate sustainability management based on the concepts of T. Dyllick and K.Hockerts (2002).

[Economic Capital]

T. Dyllick and K.Hockerts (2002) argued that the realization that economic capital has to be managed in a sustainable way is by no means new on the basis of introduction of the use of income calculation by Hicks[83]. However, they (2002) emphasized that economic capital and income should be well understood. They (2002) argued that calculating it seems quite straightforward: add up the assets of a firm and subtract the liabilities. But what exactly are corporate assets? Traditionally one would consider fixed capital (e.g. investments in machinery) and current operating capital (e.g. bank account, goods on stock, receivables). Nonetheless, it is far from easy to answer the question 'What did we earn last month?' (see e.g. Harris, 1936). Take, for example, inventory valuation. Are stocks to be considered at their raw material value? Or should the work done to make them into final goods be added? As the gap between book value and market value increases, intangible capital becomes more important and this leads to new concepts such as intellectual and organizational capital (e.g. Roos et at., 1997; von Krogh et al., 1998; Stewart, 1999).

Therefore, they (2002) suggest that the following two things should be understood for the concept of economic sustainability. First we have to acknowledge that both financial and management accounting can provide managers only with an approximation of a firm's economic capital. Furthermore, economic sustainability requires firms to manage several types of economic capital[84]. A company ceases to exist once no economic capital is left, but in reality a company will become unsustainable long before. **A definition for corporate economic sustainability** could accordingly be:

> **Economically sustainable companies guarantee, at any time, cash flow sufficient to ensure liquidity while producing a persistent, above average, return to their shareholders (or stakeholders)**

[Natural Capital][85]

Ecological sustainability is based on the realization that on a finite Earth the depreciation of 'natural

[83] He explained the use of income calculations as '[giving] people an indication of the amount which they can consume without impoverishing themselves. Following this idea, it would seem that we ought to define a man's income as the maximum value which he can consume as the maximum value which he can consume during a week, and still be expected to be as well off the end of the week as he was as the beginning'(Hicks, 1939, 1946, p. 172).

[84] T. Dyllick and K.Hockerts (2002) present ***financial capital*** (i.e. equity, debt), ***tangible capital*** (i.e. machinery, land, stocks) and ***intangible capital*** (i.e. reputation, inventions, know-how, organization routines) as an economic capital.

[85] T. Dyllick and K.Hockerts (2002) consider the form of natural resources and ecosystem services as two mains of natural capital: The former is consumed in many economic processes, and can either be renewable (e.g. wood, fish, corn) or non-renewable (fossil fuel, biodiversity, soil quality). The examples of the latter are considered "climate stabilization, water purification, soil remediation, reproduction of plants and animals" which, even though the value of these services is quite considerable, are much less understood than natural resources.

capital' (Lovins et al., 1999, p. 146) cannot go on endlessly. The need to understand the links between the industrial and eco-system has lead to the notion of 'industrial metabolism' (Ayres, 1994, 1989). This idea conceives of industry as a living organism consuming energy and materials and creating desired output (in the form of products and services) as well as undesired output (in the form of waste and emissions). If the industrial organism consumes more energy and materials than can be reproduced or if it emits more emissions than can be absorbed through natural sink, the industrial system becomes ecologically unsustainable (Ayres, 1995, p.4). Lovins et al. (1999, p. 146) estimate the annual economic value of services provided by the global natural capital to be at least $33 trillion, roughly equivalent to the world gross product, but this comparison can be dangerous for the natural environment, because there is no known substitute or one is available only at a prohibitive price. **A definition for corporate ecological sustainability** could accordingly be:

> **Ecologically sustainable companies use natural resources at a rate below the natural reproduction, or at a rate below the development of substitutes. They do not cause emissions that accumulate in the environment at a rate beyond the capacity of the earth's systems to degrade the emissions. Finally, they do not engage in activity that degrades eco-system services**.

[Social Capital][86]

The notion that firms have to manage social capital is not new. The concept of 'corporate social responsibility' (see the section 4.3.4 in chapter 4) started to generate broader interest in the 1950s~1960s (Bowen, 1953; Goyder, 1961; Likert, 1967), and then spread to continental Europe in the early 1970s (Davis 1975; Carroll 1979). However, from the mid-1980s to the mid-1990s a wide rand of approaches were applicable to the issue. Only in the very recent past has the topic once again started to attract the interest of academic, pressure groups and businesses alike.

To be a socially sustainable enterprise, Gladwin et al. (1995b, p. 42) requires that a firm needs to internalize social costs, maintain, and grow the capital stock; avoid exceeding the social carrying capacities, and encourage structures for self-renewal; foster democracy; enlarge the range of people's choices and distribute resources and property rights fairly. A problem with such a definition is that firms often cannot meet the expectations of all stakeholder groups simultaneously (T. Dyllick and K.Hockerts , 2002). They face trade-offs between the needs of different stakeholders. A possible solution to this dilemma could be a definition of socially sustainable corporations such as those that are seen as fair and truthworthy by all stakeholder groups (Zadek et al., 1997, p.13; Kaptein and Wempe, 2001).

[86] Human capital and societal capital can be considered as social capital. **Human capital** concerns primarily aspects such as skill, motivation and loyalty of employees and business partners. **Societal capital**, on the other hand, includes the quality of public services, such as a good educational system, infrastructure or a culture supportive of entrepreneurship (T. Dyllick and K.Hockerts , 2002).

T. Dyllick and K.Hockerts (2002) argued that, from this perspective, a firm can be viewed as managing social capital in a sustainable way when its stakeholders understand and can broadly agree with why a company's management is doing something, and not so much whether they think a particular act is a good thing. For example, imagine that a company decides to close a plant and layoff its workers. If the company can effectively communicate the reasons for closing the facility, and make clear why it had no alternatives, such a conduct could very well be considered socially sustainable. **A definition for corporate social sustainability** could accordingly be:

> **Socially sustainable companies add value to the communities within which they operate by increasing the human capital of individual partners as well as furthering the societal capital of these communities. They manage social capital in such a way that stakeholders can understand its motivations and can broadly agree with the company's value system.**

In addition, according to T. Dyllick and K.Hockerts (2002), three factors - non-substitutability of capital, irreversibility and non–linearity of capital depletion – are prerequisites in order to truly establish and conduct corporate sustainability management:

- **The non-substitutability of capital**: Traditional economic theory assumes that all input factors of production can be translated into monetary units, implying that they can also be substituted completely. Economic capital can thus very well substitute social capital and natural capital (Maler, 1990, p.26). Daly (1991, p.20), however, points to the fact that not all kinds of natural capital can be substituted by economic capital (Minsch, 1993). While it is possible that future generations can find ways to substitute some natural resources through technical innovations, it is much more unlikely that they will ever be able to substitute ecosystem services (e.g. the protection provided by the ozone layer, or the climate stabilizing function of the Amazonian forest). This is why Costanza et al.(1991. p.8) emphasize the complementarity of natural capital and economic capital. A major obstacle to substitutability lies in the multi-functionality of many natural resources. Forests, for example, not only provide the raw material for paper (which can be substituted quite easily), but they also provide shelter for plants and animals, regulate the flow of rain water, absorb CO_2 and may contain plants with valuable pharmaceutical properties.

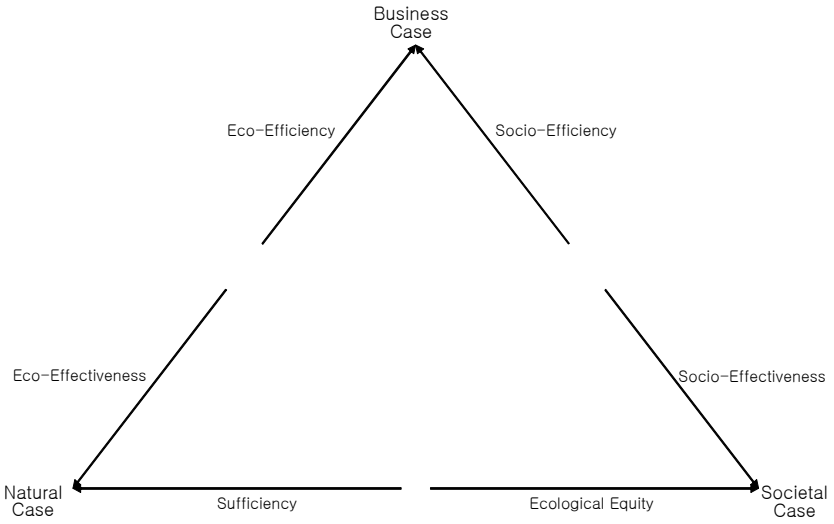
  Similar considerations are also true in the case of social capital. Although it is possible to substitute the effect of motivation and loyalty of stakeholders through economic incentives, there are certain limits to such an approach. When stakeholder disaffection reaches a certain point, firms cannot undo this by simply offering higher wages or other financial benefits. The resource-based view of the firm (Barney, 1991) – which states that certain capabilities can be substituted by others – implicitly recognizes that certain kinds of social capital cannot be easily substituted. This becomes even more evident at the level of societal capital, which is a major precondition for economic activity. No firm can thrive in a society that is not well educated or healthy or lacks adequate infrastructure.

Finally, we have to consider the normative limits of substitutability (Daly, 1991, p. 41). Even if certain species were of no direct or indirect valued to mankind, would we not be morally and ethically required to protect them beyond the mere consideration from an anthropocentric optimum? Attempts to protect cultural heritage, as well as linguistic and cultural diversity (Harmon, 1996; Wurm, 1996), are also indicators that do not support economic substitutability of social capital.

- **Irreversibility of capital depletion**: Another problem of natural and social capital deterioration lies in their irreversibility. The loss in biodiversity, for example, is definite. Up to a certain point, reduced soil productivity can be substituted through increased use of fertilizer. However, in many parts of the world, soil erosion has reached the level of deterioration at which the damage can no longer be reversed. The same is true for cultural diversity. For example, since the arrival of the Portuguese in Brazil 500 years ago the number of indigenous languages has dropped by more than 75% (British Telecom, 2000, p.13).
- **Non-linearity of capital depletion**: A further problem lies in the non-linearity of natural and social processes, A lake can, for example, absorb nutrients for a long time while actually increasing its productivity. However, once a certain level of algae is reached, the lack of oxygen causes the lake's ecosystem to break down all of a sudden. Similarly, the consumption of natural and social capital often has no impact until a certain threshold is reached. Ehrlich and Ehrlich (1981, p, xi) make the useful comparison between marginal analysis – the major tool of neoclassical economic analysis – and an airplane mechanic who removes a single rivet before each flight. He can argue that the plane is able to fly with fewer rivets until the point at which the plane breaks up and crashes.

T. Dyllick and K.Hockerts (2002) posit that, for a firm to become truly sustainable, it has to address three cases of sustainable development because the three capital types are not completely substitutable. In the business case, in trying to bring sustainability 'down to earth', many businesses and academic scholars (Thorpe and Mani, 2003; Sustainability, 2001; Reinhardt, 1999; Dyllick, 1999; Fussler and James, 1996) have tended to be focused only on business case. However, they (2002) argue that, such an approach is an important step towards corporate sustainability, it is unfortunately not enough, and thus, two more cases must be addressed. First, managers have to consider the 'natural case' for corporate sustainability. As long as a firm is operating close to (or even beyond) the environment's carrying capacity, it can never become truly sustainable. Second, firms also need to make 'societal case' for sustainability. The three cases and six criteria are presented in figure 4.3, which show that business conduct should be judged not only on a relative scale, but also in relation to the absolute environmental and social impact a firm could reasonably have achieved (See T. Dyllick and K. Hockerts, 2002, pp. 135~138, for the explanation of six criteria in detail).

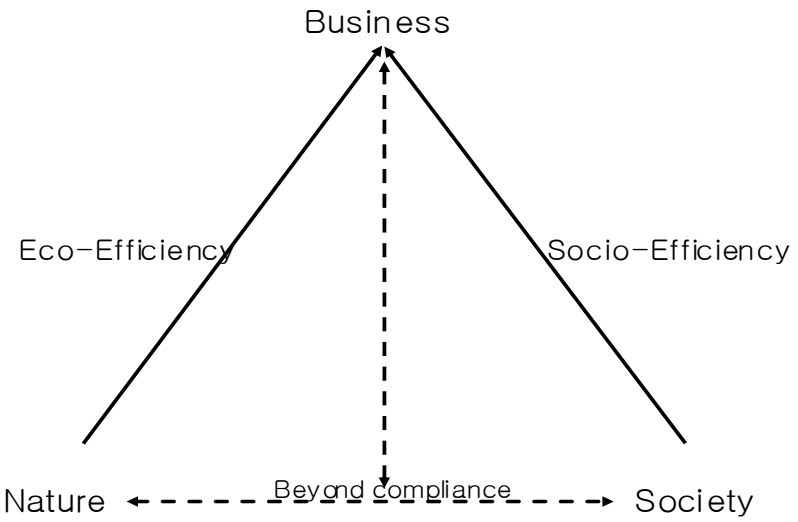
Figure 4.3 Overview of the six criteria for corporate sustainability



Source: T. Dyllick and K. Hockerts (2002)

However, this dissertation focuses upon the business case for sustainable development. The objectives of the dissertation pertain to how and why firms can further their economic sustainability by paying attention to environmental and social issues, i.e. increase their ecological and social efficiency (see Section 1.3 in Chapter 1). Some indicators to guide firms on sustainability criteria such as sufficiency, ecological equity and social efficiency do not yet exist or have not yet been adequately explored. This dissertation focuses mainly upon Korean companies which are in the infant stage in sustainability perspectives. Therefore, the dissertation analyzes Korean companies based on the business case of corporate sustainability (See Figure 4.4). The "corporate value matrix for sustainability," is presented in section 4.5 based on the analysis of key criteria for corporate sustainability presented in section 4.4.

Figure 4.4 the 'Business case' for corporate sustainability



There are two criteria for the business case for corporate sustainability management: eco-efficiency and socio-efficiency. The former criterion, which constitutes a firm's efficient use of natural capital, has been accepted most broadly. It is usually calculated as the economic value added by a firm in relation to its aggregated ecological impact (Schaltegger and Sturm, 1990, 1992, 1998). This idea has been popularized by the WBCSD as the 'business link to sustainable development' (Schmidheiny, 1992; Ayres et al 1995; DeSimone and Popoff, 1997) and current indicators used include energy, water and resource efficiency, as well as waste or pollution intensity (http://www.wbcsd.org):

> **Eco-efficiency is achieved by the delivery of competitively-priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the earth's carrying capacity (Desimone and Popoff, 1977, p.47).**

The second criterion of the business case, even though it has been so far less explored, describes the relation between a firm's value added and its social impacts (Hockerts, 1996, 1999; Figge and Hahn, 2001). The assumption for environmental impact, namely most business impacts on the environment are negative, not true for social impacts. In case of social impacts, both positive (e.g. corporate giving, creation of employment) and negative (e.g. work accidents, human rights abuses). Depending on the type of impact, socio-efficiency thus, implies minimizing negative social impacts (i.e. accidents per value added) or maximizing positive social impacts (i.e. donations) in relation to the value added.

The purposes of the strategy for corporate sustainability management are generally separated into two streams. One stream is Elkington's perspective, in which the firm's ultimate objective is not singular (create value for its shareholders) but rather three-fold (create economic, ecological, and social value), therefore, the essence of the sustainable firm is not economic growth but rather sustainable development (Elkington, 1997).

Another stream of the literature has made the attempt to demonstrate how firms might gain competitive advantage from sustainability strategies through cost savings and product stewardship (Porter and Kramer, 2002; Hart and Ahuja, 1996; Porter and Van der Linde, 1995; Shrivastava, 1995), acquisition of strategic resources and capabilities (Hart, 1995; Rodriguez et al., 2002), and development of learning and dynamic capabilities (Hart and Sharma, 2004). The author of this dissertation thinks that the perspectives of the former and the latter can not be differentiated, in practice. The latter stream is based on instrumental investment theory (Industry Organization Model) and natural resource based theory (Resource-Based Model) (see Chapter 2). Those companies will survive in the market through a set of integrated actions or certain capabilities not to be imitated or substituted by others; it will lead to the minimization of the distortion of resource use by the invisible hands of the market, in the long-term,

it will help us make progress toward sustainable societies. Therefore, strategic sustainability management of a firm can be:

A set of integrated actions or certain capabilities of firms to attain sustainable competitive advantage by value-creating on the basis of fulfillment of a wide range of its objectives which are valuable and cannot be (easily) duplicated

4.3 Core elements of each capital in Corporate Sustainability Management

This section of the dissertation provides the key elements of each capital of CS on the basis of the concepts and definition of corporate sustainability and each indicator defined in section 4.3. Arguments by researchers and the evaluation criteria of rating institutes including indicators of Global Reporting Initiatives are included as well.

4.3.1 Key elements considered by academic societies for CSM

In order to obtain sustainable competitive advantage, advocates of the resource-based view in strategic management emphasize that companies have to build upon their own internal resources and capabilities (see Table 4.4).

Table 4.4 Key resources and capabilities for sustainable competitive advantage by noted researchers

Researchers	Key factors	
Barney (1991)	Physical capital resources	the physical technology used in a firm, a firm's plant and equipment, its geographic location, its access to raw material
	Human capital resources	Training, experience, judgment, intelligence, relationships, insight of individual managers and workers in a firm
	Organizational capital resources	A firm's formal reporting structure, its formal and informal planning, controlling and coordinating systems, informal relations among groups within a firm and between and those in its environment
Grant (1991)	Tangible resource	Financial reserves, physical resources (e.g. plant, equipment, stocks of raw materials)
	Intangible resource	Reputation, technology, human resources (include culture, the training and expertise of employees, employees' commitment and loyalty
	Personnel-based resource	
Hart (1995)	Capabilities: Technology, Design, Procurement, Production, Distribution, Service	Strategic Capabilities: Pollution Prevention, Product Stewardship, Sustainable Development
Russo & Fouts (1997)	Physical asset(resource) and technology & skill capability	
	Human resources and organizational capabilities	
	Intangible resource	Reputation, political acumen

These elements are essential to decide the key factors of TBL for corporate sustainability. They focus on physical resources such as technology, plant and equipment, human resources such as training, experience, intelligence and organizational resources or intangible resources such as reputation, employees' commitment and loyalty. Hart (1995), focused upon internal capabilities such as technology, design, procurement, production, distribution, and service, emphasizing environmentally strategic capabilities such as pollution prevention, product stewardship, sustainable development for sustainable competitive advantage.

Schwarts and Dahl, Carroll (1999), Sustainability/UNEP (2001), T. Dyllick and K. Hockerts (2002), and Thorpe and Prakash-Mani (2003) classified the key issues for sustainable competitive advantage on the basis of corporate sustainability management. Among them, Schwarts and Dahl and Carrol (1999) presented key issues required in corporate social responsibility perspectives for interplaying between a firm and society efficiently on the basis of the insight and survey results of 50 academic leaders. Sustainability/UNEP (2001) and Thorpe and Prakash-Mani (2003) provided key issues based on the TBL concept. In the case of the latter, those issues were developed for emerging markets. T. Dyllick and K.Hockerts (2002) argued that, for a firm to become truly sustainable, it has to address three cases of sustainable development; that is to say, the business case, the natural case, and the social case. They (2002) suggest three capitals and its key factors in detail for sustainable development of a firm. Three pillars and its key factors defined on the basis of capital are highly helpful to be linked with the goal of a firm in contractual obligation to stakeholders' perspectives and its concept can be well reflected in the definition of corporate sustainability management in this dissertation (see section 4.3.7 in Chapter 4, p. 38). Table 4.5 provides key factors for CS in strategic management perspectives from various researchers.

Table 4.5 Key factors for Corporate Sustainability in strategic management perspectives

Schwarts and Dahl	Socially acceptable behavior at the operational level	・Disclosure of information to shareholders, disclosure of the board of directors, monopolistic behavior (predatory pricing etc.), equality of treatment for minorities, profit sharing, environmental protection, ethics in advertising, social impact of technology
Carroll (1999)	Social issues in the management field (Survey result of 50 academic leaders in 1994)	・Business Ethics, International social issue, Business and society/social issue, Corporate social performance, Business and government/public policy, Environmental issues, Theory/research methods development, Issues within corporations, Strategic issues, Corporate governance, Stakeholder
Sustainability /UNEP (2001)	Business success factors	・Financial Performance: Shareholder value, revenue, operation efficiency, access to capital ・Financial Drivers: Customer attraction, Brand Value & Reputation, Human & Intellectual Capital, Risk profile, Innovation, License to Operate

	Sustainability success factors	・Ethics, Values & Principles, Accountability & Transparency, Triple Bottom Line Commitment, Environmental Process Focus, Environmental Product Focus, Socio-Economic Development, Human Rights, Workplace Conditions, Engaging Business Partners, Engaging Non-Business Partners
T. Dyllick and K.Hockerts (2002)	Economic Capital	・Financial capital : i.e. equity, debt, ・Tangible capital : i.e. machinery, land, stocks ・Intangible capital: i.e. reputation, inventions, know-how, organization routines
	Natural Capital	・natural resources: e.g. wood, fish, corn (renewable) or fossil fuel, biodiversity, soil quality (non-renewable) ・ecosystem services: e.g. climate stabilization, water purification, soil remediation, reproduction of plants and animals
	Social Capital	・Human capital: skill, motivation and loyalty of employees, business partners. ・Societal capital: the quality of public services, such as a good educational system, infrastructure or a culture supportive of entrepreneurship
Thorpe and Prakash-Mani (2003)	Business success factors	・Revenue growth and market access, Cost savings and productivity, Access to capital, Risk management and license to operate, Human capital, Brand value and reputation
	Sustainability success factors	・Governance and management, Stakeholder engagement, environmental process improvement, environmental products and services, Local economic growth, Community growth, Human resource management

4.3.2 Analysis of Evaluation criteria used by the main rating institutes

The author of this dissertation investigated and compared the evaluation criteria of the main rating institutes such as SAM DJSI, FTSE4Good, Domini 400, SNS Bank, and GRI[87](See Appendix for information in detail). According to their own perspectives, the criteria are slightly only different, but together with factors suggested by some researchers, they are helpful to select suitable items for each of the TBL elements of corporate sustainability management.

1) SAM DJSI

SAM DJSI is based upon corporate sustainability defined as "a business approach that creates long-term shareholder value by embracing opportunities and managing risks deriving from economic, environmental and social developments. A defined set of 'criteria and weightings' is used to assess the opportunities and risks deriving from economic, environmental and social developments for the eligible companies. Sustainability driving forces analyzed by SAM are based on SAM's Corporate Sustainability Research (See Table 4.6). The assessment is conducted in three evaluation stages: Stage 1,

[87] The Global Reporting Initiative (GRI) is a multi-stakeholder process and is an independent institution whose mission is to develop and disseminate globally applicable Sustainability Reporting Guidelines.

the Questionnaire Assessment, Stage 2, the Quality and Public Availability of information, and Stage 3, Verification of the truthfulness of questionnaire and the review of a company's involvement in critical issues.

Table 4.6 Sustainability Driving Forces analyzed by SAM

Economic Force	Ecological Forces	Socio-Cultural Forces
Increasing speed of embracing innovation and product cycles, business relationships, and competition	Global climate changes and ecological instabilities	Global transparency in society through media and technological connectivity – corporate behavior is clear for all the world to see
Continuous scientific and technological progress	Increasing ecological degradation with negative impact on human health and quality of life	Divergent demographic trends in developed and less developed regions
Information is key factor	Loss of eco-systems and biodiversity	Wide social imbalance and inequalities in developed and less developed regions (income, poverty, human, rights, etc)
Technological connectivity and virtualization of (business) relationships	Lower capacity of natural sinks suck as carrying capacity is decreasing (soil, water, forests, etc)	Urbanization and urban lifestyles
Globalization and liberalization of economic activities	Scarcity of water in terms of both quality	New lifestyles of self-organized groups with shared values
Increasing power of multi-national businesses compared to national states		Consumer behavior changing due to increasing awareness of for inequalities, social imbalance, human rights and unfulfilled development potential
Shift from supply-side to demand-side markets		Consumer behavior changing due to increasing awareness of ecological changes and social instabilities

Source: Van Den Brink (2002)

Based on Sustainability driving forces, evaluation criteria of SAM were featured as follows;

- **Economic Dimension:** Based on regulatory and code of conduct, it focuses on corporate governance and management structure, strategic planning, performance, customer relationships in consistency of Plan-Do-Check-Act perspectives; that is to say, it strives to evaluate a firm systematically on the basis of the dynamic consistency.
- **Environment Dimension:** Based on Plan-Do-Check-Act approach, it emphasizes environmental policy, management structure, performance, reporting. Particularly, eco-efficiency is required as a key indicator for measuring improved environmental performance.
- **Social Dimension**: it is focused mainly on real social 'do and check', human resource management for enhancing human capital, stakeholder engagement, particularly relationships with suppliers, social impacts on communities, and reporting.

SAM DJSI classified two kinds of industries for application of its criteria. The one is a general industry which all kinds of industries are included and the other is a specific industry considered the characteristics in TBL perspectives.

2) FTSE4Good

The FTSE4Good Index Series has been designed to measure the performance of companies that meet globally recognized corporate responsibility standards, to facilitate investment in those companies and contribute to creating Socially Responsible Investment products, and ultimately to contribute to the development of responsible business practices around the world.

The FTSE4Good selection criteria have been designed to reflect a broad consensus on what constitutes good corporate responsibility practice, globally. The criteria originate from common themes of ten sets of declared principles[88]. Originated from ten international principles, evaluation criteria of FTSE4Good are featured as follows;

- **Economic Dimension**: The scope of CSR defined by FTSE4Good focuses mainly on environmental and social issues. Therefore, it does not set up the criteria for economic dimensions.
- **Environment Dimensio**n: Based on the Plan-Do-Check-Act approach, it emphasizes environmental policy, management structure, reporting. It applies different criteria to companies depending on their impacts on the environment. It classifies them into three levels (high/medium/low impact industries).
- **Social Dimension:** it focuses mainly on human rights, and social and stakeholder issues. It is also based on the Plan-Do-Check-Act approach to address issues such as policy, management, reporting or practice/performance.

Using a widespread market consultation process, the criteria are regularly revised to ensure that they continue to reflect standards of responsible business practice, and developments in socially responsible investment as they evolve. Since the index series was launched in July 2001, the environmental criteria and human rights criteria have both been strengthened. The FTSE4Good inclusion criteria are designed to be challenging but achievable in order to encourage companies to try to meet them. The key features of FTSE4Good are as follows:

- Evolving selection criteria to reflect changes in globally accepted corporate responsibility standards and codes of conduct, over time;
- Challenging yet achievable criteria to encourage companies to strive to meet them;
- Higher impact companies have to meet higher standards;

[88] Three of which are "governmental" and seven of which were created by either Non-Governmental Organizations (NGOs) or business organizations. These principles were used to create the FTSE4Good selection criteria. ① Universal Declaration of Human Rights, ② The OECD Guidelines for Multinational Enterprises, ③ The UN Global Compact, ④ CERES (Coalition for Environmentally Responsible Economies), ⑤ Amnesty International Human Rights Principles for Companies, ⑥ The Caux Round Table Principles for Business,⑦ The Global Sullivan Principles, ⑧ Ethical Trading Initiative, ⑨ SA 8000, ⑩ Global Reporting Initiative Sustainability Guidelines

· Transparent criteria and methodology;
· Criteria based on respected codes and principles with new criteria subjected to a widespread consultation and approved by an independent advisory committee;

3) Domini 400

The KLD Domini 400 Social^{SM} Index (DS 400 Index) (KLD) is the established benchmark for measuring the impact of social screening on financial performance. It provides research on the social and environmental records of publicly traded companies to institutional investors worldwide. *KLD Social Ratings* basically consist of two criteria by which KLD measures corporate social responsibility: *Social Issues and Controversial Business Issues*

· *Social issue ratings*: These ratings measure corporate social responsibility across a range of issues that impact the company's various stakeholders (See Table 4.7).
· *Controversial Business Issues*: These ratings reflect company involvement in lines of business of interest to social investors (e.g. Abortion, Contraceptives, Military, Weapons, Adult Entertainment, Firearms, Nuclear Power, Alcohol, Gambling, Tobacco)

The features of the KLD Domini 400 index are on the basis of environmental and social issues and evaluate each item based upon both strengths and weaknesses. However, the author of this dissertation classifies the criteria into three types according to the TBL. Some criteria such as corporate governance and product quality belong in the economic dimension. Based on these categories, the evaluation criteria of the KLD Domini 400 index are as follows:

· **Economic Dimension:** The main focus of the KLD Domini 400 is based on the concept of Corporate Social Responsibility which is closely related to environmental and social issues. Therefore, corporate governance and product quality may be considered as economic dimensions.
· **Environmental Dimension**: It tends to evaluate the environmental liabilities, impacts, policy and practices perspectives. Therefore, the environmental criteria focus is on materials or toxic substances that are not permitted due to regulations and impacts on the environment.
· **Social Dimension**: The main foci of the social dimension are community, employee relationships, human rights, and diversity (including gender equity, culture etc).

4) SNS Bank

The SNS Asset Management Bank is the leading institutional investor in The Netherlands, specialized in investing based on the sustainability concept. The SNS Bank uses two types of assessments: Sector screening and Stock Picking. The sector screening looks at a specific sector (e.g. the Steel Industry) and determines which companies perform best in class. The performance is a relative performance, benchmarked against peers from the same industry. The stock picking looks at all companies and selects the best performers. In stock picking some activities and sometimes sectors are excluded due to the unsustainable nature of the business (for example the weapons industry, the oil industry).

In their assessment of companies the SNS bank uses a roadmap that addresses all aspects of a company's performance. The main goal of the assessment is to be able to identify the processes around sustainability in a company. The bank analyses deeper than just a checklist with things that a company can do (the activities), the process and organizational structure built around sustainability are just as important. The main criteria of table 4.7 are applied step-by-step in their analyses.

· **Economic Dimension**: emphasizing business ethics as principle

· **Environmental Dimension**: emphasizing environmental strategy as a planning and product and service, and supplier and contractors in environmental perspective.

· **Social Dimension**: Focusing on human capital, social and ethical accounting, auditing, and reporting.

5) GRI

The Global Reporting Initiative (GRI) is a multi-stakeholder process and independent institution whose mission is to develop and disseminate globally applicable Sustainability Reporting Guidelines. These Guidelines are for voluntary use by organizations for reporting on the economic, environmental, and social dimensions of their activities, products, and services. Indicators on triple dimensions can be criteria of corporate sustainability management. GRI classifies indicators into core and additional performance categories. The performance indicators are grouped under three sections covering the economic, environmental, and social dimensions of sustainability. The features of GRI indicators are as follow:

· **Economic Dimension:** concerning an organization's impacts[89] on the economic circumstances of its stakeholders and on the economic systems at the local, national and global levels. Economic impacts can be divided into direct and indirect impacts.

① Direct Impacts are designed to:

- measure the monetary flows between the organization and its key stakeholders; and,
- indicate how the organization affects the economic circumstances of those stakeholders.

[89] These impacts can be positive or negative. Broadly speaking, economic performance encompasses all aspects of the organization's economic interactions, including the traditional measures used in financial accounting, as well as intangible assets that do not systematically appear in financial statements. However, economic indicators as articulated by GRI have a scope and purpose that extends beyond that of traditional financial indicators. Financial indicators focus primarily on the profitability of an organization for the purpose of informing its management and shareholders. By contrast, economic indicators in the sustainability reporting context focus more on the manner in which an organization affects the stakeholders with whom it has direct and indirect economic interactions. Therefore, the focus of economic performance measurement is on how the economic status of the stakeholder changes as a consequence of the organization's activities, rather than on changes in the financial condition of the organization itself. In some cases, existing financial indicators can directly inform these assessments. However, in other cases, different measures may be necessary, including the re-casting of traditional financial information to emphasize the impact on the stakeholder. In this context, shareholders are considered one among several stakeholder groups (http://www.globalreporting.org).

② Indirect impacts are designed to:

- measure the total economic impact of an organization that includes indirect impacts stemming from externalities[90], which are those costs or benefits arising from a transaction that are not fully reflected in the monetary amount of the transaction., that create impacts on communities, broadly defined.

· **Environmental Dimension:** concerning an organization's impacts on living and non-living natural systems, including ecosystems, land, air and water. Both absolute figures and normalized measures (e.g., resource use per unit of output) are particularly provided as environmental performance information. Both measures reflect important, but distinct, aspects of sustainability. Absolute figures provide a series of scales or magnitudes of the use or impact, which allows the user to consider performance in the context of larger systems. Normalized figures illustrate the organization's efficiency is such a way that it supports comparison between organizations of different sizes.

· **Social Dimension**: concerning an organization's impacts on the social systems within which it operates. It can be gauged through an analysis of the organization's impacts on stakeholders at the local, national, and global levels; in some cases, influencing the organization's intangible assets, such as its human capital and reputation. The main indicators of the social dimension consist of labor practices and decent work, human rights, social, and product responsibility[91].

According to the perspectives or understanding of sustainability, key indicators for corporate sustainability suggested by the rating institutes and by the GRI constitute a wide range of issues and concepts(see Table 4.7). Broadly speaking, the environmental dimension summarized in that the companies should consider pollution prevention and the impacts of their products across their entire life cycle. In the case of the economic and social dimensions, the detailed indicators are a little different according to the institutes, but their general directions for corporate sustainability management include:

· The target of corporate sustainability management is the stakeholders including shareholders. Therefore, the scope and purpose of the economic dimension, if possible, should extend beyond that of traditional financial indicators. Namely, economic performance measurement should be included about how the economic status of the stakeholder changes as a consequence of the firm's activities, rather than on changes in the financial condition of the firm itself;

· With regard to the environmental dimension, together with normalized indicators for measuring the firm's efficiency, absolute indicators are also needed in sustainability perspectives:

· Due to complexities of the issue, the detail of items of social dimensions is not easy to be decided.

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[90] Examples of externalities might include(http://www.globalreporting.org):
· innovation measured through patents and partnerships;
· economic effects (positive or negative) of changes in location or operations; or
· contribution of a sector to Gross Domestic Product or national competitiveness.

[91] The specific aspects for labor practices and human rights performance are based mainly on internationally recognized standards such as the Conventions of the International Labor Organization (ILO) and international instruments such as the United Nations Universal Declaration of Human Rights. In particular, the labor practices and human rights indicators have drawn heavily on the ILO Tripartite Declaration Concerning Multinational Enterprises and Social Policy, and the Organization for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises (http://www.globalreporting.org).

However, human resource management, labor practice and human rights, and the relations with the community in which a firm operates should be considered as a direction of social dimension;

· As an approach method, the plan-do-check-act (PDCA) is recommended for consistency based on the commitment of the firm's CEO and of the management. As well, business principles including international standards are needed for the systematic implementation of the PDCA approach;

· In order to enhance transparency or objectiveness, corporate governance and reporting are needed.

Table 4.7 Criteria of Key Rating Institutes for CSM performance evaluation

	Economic Dimension	Environ mental Dimension	Social Dimension
SAM DJSI	·Corporate Governance (11) ·Invest Relation (3) ·Strategic Planning (4) ·Scorecards/ Measurement Systems (2) ·Risk/Crisis Management (4) ·Code of Conduct /Compliance/ Corruption & Bribery(6) ·Customer Relationship Management (4) ·Transparency('04)/ Financial Robust('03) (1)	·Environmental Policy/ Management (6) ·Environmental Performance (Eco-Efficiency) (1) ·Environmental Reporting (1) ·Advanced Environmental Management System (5) ·Advanced Environmental Performance (1) ·Climate Strategy (5) ·Biodiversity (8)	·Labor Practice Indicators (4) ·Human Capital Development (5) ·Talent Attraction & Retention (10) ·Knowledge Management/ Organization Learning (2) ·Standard for Suppliers(2) ·Stakeholder Engagement(3) ·Corporate Citizenship/ Philanthropy (4) ·Social Reporting (1) ·Social Impacts on Communities (7) ·Occupational Health & Safety (6)
FTSE4Good	·Basically, it posits that other financial index including FTSE 100 etc cover economic dimension	·Policy: Core Indicators for HI S(5), Desirable Indicators for MIS (4) ·Management (6) ·Reporting: Core Indicators for HIC (4), Desirable Indicators for SIC (6)	·Human Rights: Policy(6), Management(4), Reporting(2) ·Social & Stakeholder: Policy (2), Management(4), Practice/ Performance (1)
Domini 400	·Corporate Governance: (S) Limited Compensation, Ownership, Other/ (C) High Compensation, Tax Disputes, Ownership ·Product Quality and Safety: (S) Quality, R&D · Innovation, Benefits Economically Disadvantaged, Other/ (C) Product Safety, Marketing · Contracting Controversy, Antitrust, Other ·Other: (S) Limited (C) High	·Environment Liabilities/ Impact/Policies and Practice: (S) Beneficial Products & Services, Clean Energy, Pollution Prevention, Recycling, Alternative Fuels, Communications, Other/ (C) Hazardous Waste, Regulatory Problems, Ozone Depleting Chemicals, Substantial Emissions, Agricultural Chemicals, Climate Change, Other	·Community:(S)Generous · Innovative Giving, Support for Housing/ (C)Education, Others; Investment Controversies, Negative Economic Impact ·Diversity: (S) CEO, Promotion, Board of Directors, Work·Life Benefits, Women·Minority Contracting, Employment of the Disabled, Gay & Lesbian Policies, Other/ (C) Controversies, Non-representation, Other ·Employ Relationship:(S) Union Relations, Cash Profit Sharing, Employee Involvement, Retirement Benefits, Other/ (C) Union Relations Safety/ Controversies, Workforce Reduction, Retirement Benefits Concern ·Human Rights: (S) Indigenous Peoples Relation, Labor Rights, Other/ (C) Burma, Labor Rights, Indigenous People Relations, Other
SNS Bank	·General Company Data (5) ·Business Ethics: Code of Conduct, Business Principles, Corporate Governance, other	·Strategy: Environmental Policy, EMS , Responsibilities policy and performance, environmental audit ·Product & Service Creation: Innovation product·service creation process, R&D investments, Energy use, Waste disposal, Transport logistics,	·Human Capital (internal): Human Resource Policy, Equal Right Policy, Reflection Background, Job Classification system, Terms of employment & Private·Family Life, Layoffs, Trade Union, Employee representation, Health & Safety ·Social and Ethical Accounting,

		Employment transport, Office management & Support services, Environmental status of office building, Products·Services Creation, Environmental status of building, Impact of production ·Product & Service Use: Low impact products·services, Eco-friendly products·services, R&D Investments, Life Cycle Analysis ·Supplier·Contractors: Demand on Suppliers·Contractors, Purchasing renewable · recyclable·recycled materials ·Other	Auditing and Reporting: Social Reporting, Social Audit, Social Accountability ·External Social Policy(Western Europe, North America): Charity·Sponsoring Policy, Employment Measures, Community Involvement ·Social Strategy in Risk Countries: Human Rights, Lobor Condition, Community Involvement, Suppliers·Contractors ·Other issues
GRI	·Customer: (CI, 2) ·Suppliers: (CI, 2), (AI, 1) ·Employees: (CI, 1) ·Provider of Capitals: (CI, 2) ·Public Sectors: (CI, 3), (AI, 1) ·Indirect Economic Effect: (AI, 1)	·Materials: (CI, 2) ·Energy: (CI, 2), (AI, 3) ·Water: (CI, 1), (AI, 3) ·Biodiversity: (CI, 2), (AI, 7) ·Emission, Effluent, and Wastes: (CI, 6), (AI, 3) ·Suppliers: : (AI, 1) ·Product and Service: (CI, 2) ·Compliance: (CI, 1) ·Transport: (AI, 1) ·Overall: (AI, 1)	·Labor Practice & Decent Work: Employment(CI, 2; AI, 1), Lobor & Management Relations(CI, 2; AI, 1), Health & Safety (CI, 4; AI, 2), Training & Education(CI, 1; AI, 2), Diversity & Opportunity (CI, 2) ·Human Right: Strategy & Management (CI, 3; AI, 1), Non-discrimination(CI, 1), Freedom of Association & collective bargaining(CI, 1), Child labor(CI, 1), Forced & Compulsory Labor(CI, 1), Disciplinary Practices(AI, 2), Security Practices(AI, 1), Indigenous Practices (AI, 3) ·Society: Community(CI, 1; AI, 1), Bribery & Corruption(CI, 1), Political Contribution(CI, 1; AI, 1), Competition & Pricing(AI, 2) ·Product Responsibility: Customer Health & Safety(CI, 1; AI, 3), Product & Services(CI, 1; AI, 2), Advertising(AI, 2), Respect for Privacy(CI, 1; AI, 1)

Note: 1. ( ) No. of detailed questions related to the item; 2. HIC/MIC means High Impact Sector/ MIC means Medium Impact Sector, and FTSE4Good classified into the industry by high/medium/low impact sectors for environmental dimension. 3. 'S' of ( ) means strength and 'C' of ( ) means concern 4. 'CI' of ( ) means

4.4 Model Building for an Empirical Study

This section, based on the definition of corporate sustainability management and analysis of factors for sustainability suggested by the academic literature and evaluation criteria from rating institutes including the GRI, provides the foundation for the model for the case study on corporate sustainability management that was conducted for the dissertation and is presented in section 5.3 in chapter 5. Table 4.8 presents key indicators and their driving forces for CSM derived from 4.2 and 4.3 in Chapter 4 of the dissertation.

Table 4.8 Key indicators and their driving forces for CSM in this dissertation

Economic Capital	Financial Capital	·Revenue including Market share ·Cost Saving including productivity
	Tangible Capital	·License to operate
	Intangible Capital	·Access to capital
		·Risk Management

		・Brand Value/Reputation	
		・Transparency	・Governance & Management, ・Information of Profit Flow(for suppliers, employees, provider of capital, public sectors etc) ・Stakeholders (mainly, customer, suppliers, the communities, NGOs etc) engagement including reporting and verification)
Natural capital	Natural Resource Capital	・Pollution Prevention(or Cleaner Production) ・Environmental Friendly Product Stewardship	
	Eco-System Capital	・Environmental Awareness	
Social capital	Human Capital	・Human Resource Management	・Training and education including knowledge management, Diversity and Opportunity for Promotion , Talent Attraction & Retention
		・Labor practice/ Human Right	・Working condition including Occupational health and safety, Freedom of Association & collective bargaining, Compulsory Labor, Security Practices, Indigenous Practices
	Social Infrastructure Capital	・Socio-Economic Development: including Local economic growth, Community job creation, social infra, Corporate Citizenship/philanthropy, Anti-corruption and bribery etc.	

[**Driving forces of for the Business Sector to adopt CSM**]

The driving forces that affect the business/financial success of a firm are divided into: revenues and costs, which have the greatest influence on financial healthiness of a firm. They are largely a result of operational effectiveness/efficiency, although innovation in product design or service provision can also influence revenues, market access, and other non-financial driving forces. Indirect driving forces are the factors that have an important influence on business performance. Namely, access to capital (debt or equity) provides the funds for firms to invest in research and development or newer technologies that enhance productivity, for example, and can also directly impact a firm's balance sheet through the cost of this capital. Risk management, including the license to operate similarly has direct financial relevance by reducing costly business disruptions, but is also about building relationships with stakeholders, which can affect strategic decision-making and help a firm evolve and differentiate itself to its competition. Finally, a firm's reputation, while most directly related to its strategic positioning, can also affect operational effectiveness/efficiency through its ability to attract capital, qualified employees and business partners, and to engage in stakeholder relationship.

- **Revenue growth and market share**: This factor reflects any increase in a firm's income, including increased market share, or access to new markets.
- **Cost saving and produc**tivity: This factor reflects any reduction in a firm's operating costs or an improvement in its overall productivity and efficiency.

· **License to operate**: This factor reflects any elimination or reduction of risk in accordance with the firm's license to operate in the community where the sites were operated.

· **Access to capital**: This factor reflects the firm's ability to attract capital, as well as the cost of capital to the company.

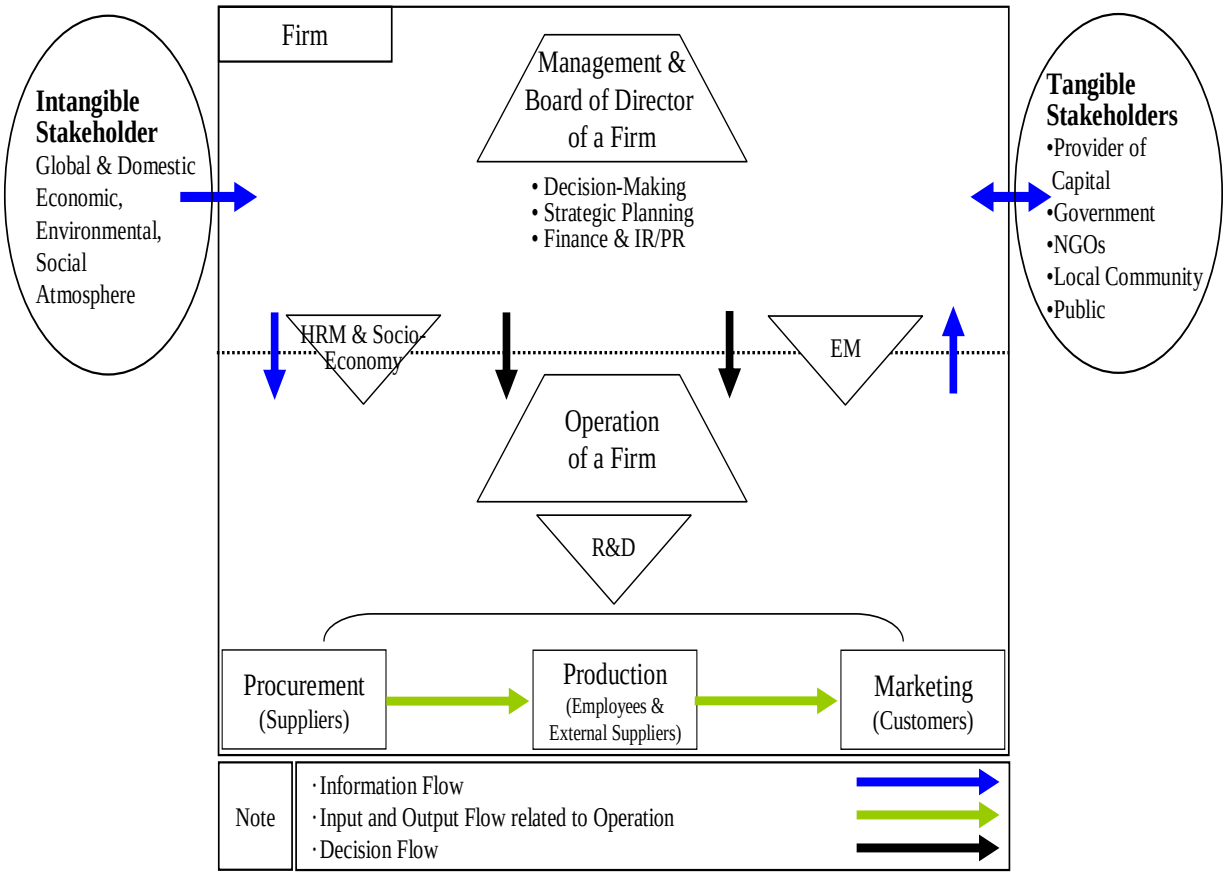
· **Risk management**: This factor reflects the reduction in the likelihood that a firm will suffer some loss, damage or disruption.

· **Brand value and reputation**: This factor reflects the public perception of a company, its products and brands. This would include the reputation of the firm, the personal reputation of the firm manager/owner as well as value of the firm.

[**Driving forces from Non-Business Sector**]

There are driving forces that indirectly affect the business/financial success of a firm. They are divided into; the transparency of economic capital, natural capital, and social capital. They focus upon:

Figure 4.5 A Firm's Stakeholder Engagement Direction



· **Governance and Management**: This factor addresses the importance of the firm's values, sound business principles including business ethics and a wide range of international standards that govern the firm. The dissertation author evaluated the information such as CEO Message, strategic framework including business principles, board of directors, and the structures, particularly the role of the

organization in charge of corporate sustainability management.

- **Information of profit flow**: This factor addresses the compensation information (in some cases, including the principle) related to the economic situation of the key stakeholders such as customers, suppliers, employees and management, the provider of capital, and the public sector which contributes to a consequence of the firm's activities.
- **Stakeholder engagement**: This factor addresses the firm's engagement with tangible stakeholders such as employees, customers, suppliers, shareholders, joint venture partners, governments, local communities, NGOs etc. and intangible stakeholder such as global and domestic economy, environmental and social atmosphere, for sustainable development and its sustainable competitive advantage including reporting and verification (See Figure 4.5). A firm's stakeholder engagement should focus on maximization of the opportunities and neutralization of threats.
- **Pollution prevention**: This factor addresses the firm's use of natural resources in the production of its goods and services and emphasizes that pollution prevention is better than "end-of-pipe' pollution control approaches.
- **Environmentally friendly products/services**: This factor addresses the importance of the firm embedding environmental principles in its development of products and services.
- **Environmental awareness**: This factor addresses the importance of the firm's awareness in its activities, ultimately creating of its improvement of process, products, and services.
- **Human resource management**: This factor addresses the firm's commitment to providing training and education including knowledge management, diversity, opportunity, talent attraction and retention. This will lead to better human capital, a firm's employees and contracted labor, with enhanced knowledge, skills and talent. Human capital is important in determining its ability to innovate and compete in the market.
- **Labor practice/human right**: This factor addresses the firm's commitment to providing a safe, high-quality work environment for its employees – including management and staff – and contract labor, mainly including occupational health and safety, freedom of association & collective bargaining, compulsory labor, security practices, and indigenous practices
- **Socio-economic development**: This factor addresses the firm's commitment to the provision of economic benefits within the community where the firm is operating, as well as contributing to the economy, social development of the community (beyond economic development), community job creation, social infrastructure related to firm business activities, corporate citizenship/philanthropy, anti-corruption, bribery, etc.

Figure 4.6 reclassifies capitals and driving forces for CSM in consideration with the strength of the relationship of traditional business factors. According to this perspective, intangible economic indicators are divided into the business sector and non-business sector. The author of this dissertation evaluated the core activities related to sustainability management within three leading Korean companies, namely, Samsung SDI, Hyundai Motor, and POSCO, in accordance with the criteria defined in Chapter 2. As discussed in Chapter 2, competitiveness derives from innovation leading either to enhanced operational

effectiveness /efficiency or to superior strategic positioning. Operational effectiveness – achieved, for example, through lower waste (in either materials or effort) or more highly motivated employees – results a company to differentiate itself from its competitors, through perhaps improved reputation, a new product design or staff training. Every aspect of competitiveness can lead to superior profitability, although, the differentiation of a firm's products and services is more significant in the long term.

Figure 4.6 Corporate Value Matrix for Sustainability

Non-Business Sector / Business Sector		Economic Capital						Natural Capital			Social Capital		
		Governance & Management	Information of Profit Flow	Stakeholders engagement				Pollution Prevention	Environmental Friendly Product	Environmental Awareness	Human Resource Management	Labor Practice/ Human Right	Socio-Economic Development
				a	b	c	d	e					
Economic Capital	Revenue Growth												
	Cost savings												
	License to Operate												
	Access to capital												
	Risk Management												
	Reputation/ Brand Value												

Note: a = Provider of Capital including shareholder, b = Suppliers, c = employees including external suppliers, d = customers, e = local communities including NGOs, and others

Based on the Corporate Value Matrix for Sustainability, the author of this dissertation developed the checklists for analyzing inner competency (capabilities) of case companies in strategic sustainability perspectives. They are based upon the "Corporate Value Matrix for Sustainability," but the structure of the CSM checklist reflects the Plan-Do-Check-Act dynamic and value chain concept of Porter in order to perform a dynamic analysis or consistency measurement between the departments or teams (See

Chapter 2). Figure 4.7 presents the conceptual method applied to the CSM checklist and Table 4.9 summarizes the checklist items including the number of particulars (See the appendix for more details).

Figure 4.7 Conceptual Applied Method for CSM Checklists

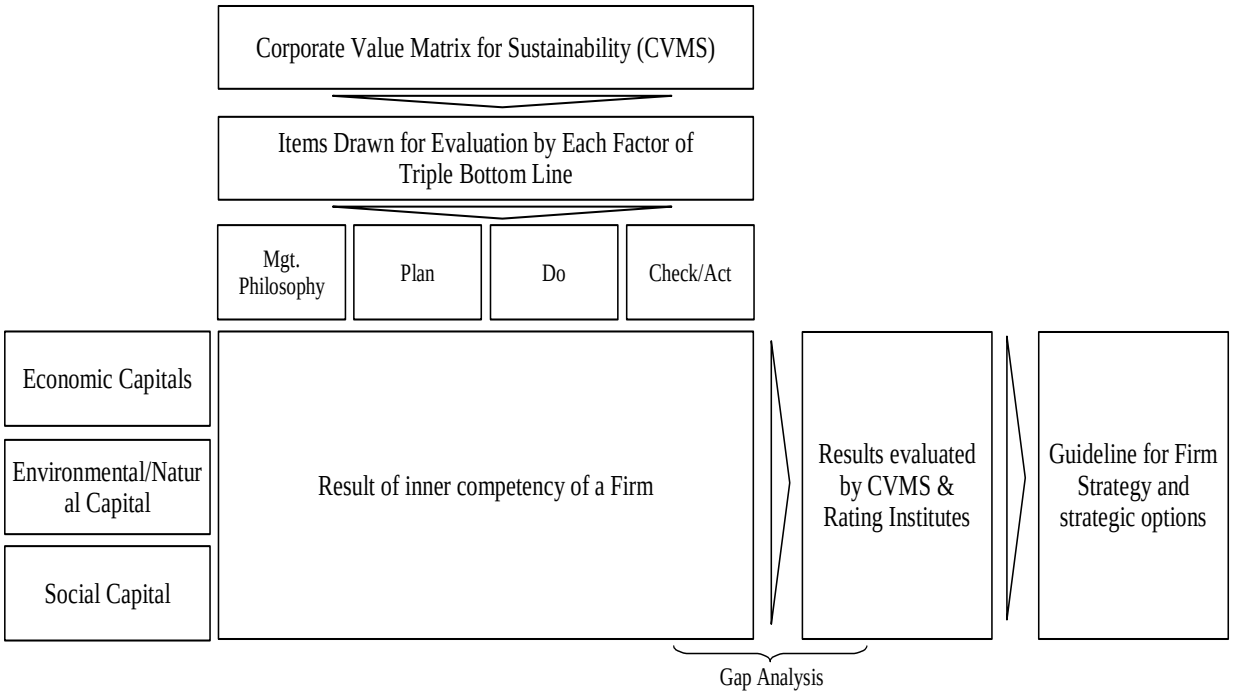


Table 4.9 Summary of CSM Checklists used in Performing the Case Study for this dissertation

Item				Particulars		No of Particulars
Economy (66)	1. Management Philosophy		1.1	Top management Commitments		2
			1.2	Vision and Mission Statements		1
			1.3	Business Principles		1
			1.4	Business ethics and Code of Conduct		6
	2. Corporate Governance		2.1	Committee of Board of Directors		3
			2.2	Operation and Function of Board of Directors		3
	Plan	3. Strategic management and planning				5
	Do	4. Risk management and planning				4
		5. Stakeholders management				6
		6. Finance				5
		7. Investor Relations				4
		8. Public Relations and Communication				6
		9. Procurement				4
		10. Operation and Process Control				3
		11. Product Control (i.e., Quality Control and R&D)				3
		12. Customer Relations				4
	Check & Act	13.Management Review	13.1	Performance Measurement		2
			13.2	Reporting		4
Environment (38)	Plan	1. Environmental Policy and management				9
	Do	2. Control	2.1	Procurement of raw materials and efficiency		2
			2.2	Energy and Water Efficiency		1

			2.3	Climate Change	2
			2.4	Environmental Pollutants Emission	4
			2.5	Environmental Friendly Products and Cleaner Production Processes	4
			2.6	Supplier and External Service Partners	4
			2.7	Environmental Stakeholder Management	2
			2.8	Environmental accident, suit, punishment & fines.	2
	Check	3. Monitoring and environmental performance measuring			3
	Act	4. Environmental Performance Reporting & Management Review			5
Society (41)	Plan	1. Social Responsibility Policy			10
	Do	2. Human Rights			5
		3. Labor Practice	3.1	Employee Relations	2
			3.2	Welfare of management and Employees	2
			3.3	Health and Safety	2
		4. Human Resource Management	4.1	Employment and management	7
			4.2	Education and Training	3
		5. Local Community	5.1	Local Community Economic Development	1
			5.2	Philanthropy and Sponsorship	2
			5.3	Partnerships	1
	Check & Act	6. Social Performance Reporting and Communication			6
Total					145

Note: See the appendix B for checklists in detail.

Figure 4.8 presents the strategic framework of CSM linked with Plan-Do-Check-Act cycle (see Figure 2.6) in order to improve corporate value measured based on "Corporate Value Matrix for Sustainability (CVMS)." It is mainly based on the concept and definition of corporate sustainability management (see p. 38 in section 4.3), which is defined on the basis of five concepts – sustainable development, environmental management, corporate social responsibility, stakeholder management, and corporate accountability. CVMS is also based on three capitals -economic, natural, and social - for corporate sustainability management. The crucial characteristics of the framework can be explained as follows:

· The management philosophy should contain the concept of sustainable development;

· The business principle should be established in order to drive a firm's sustainability management systematically. A number of international and internal standards have come into effectiveness and are in preparation (see chapter 1 and 2), and together with the emergence of corporate social responsibility as one factor of sustainable development, a normative approach of corporate social responsibility approaches, emphasizing the importance of business ethics, which has recently been considered in business society. The Korean business circles strongly argue for serious consideration of business ethics in terms of ethical management from a strategic management perspective. Table 4.9 highlights that business ethics does not exactly comply with the concept of strategic management, but is based on the covenantal obligation of the firm's purposes. Corporate sustainability management in the dissertation is basically focused upon the contractual obligations to the firm's stakeholders. Therefore,

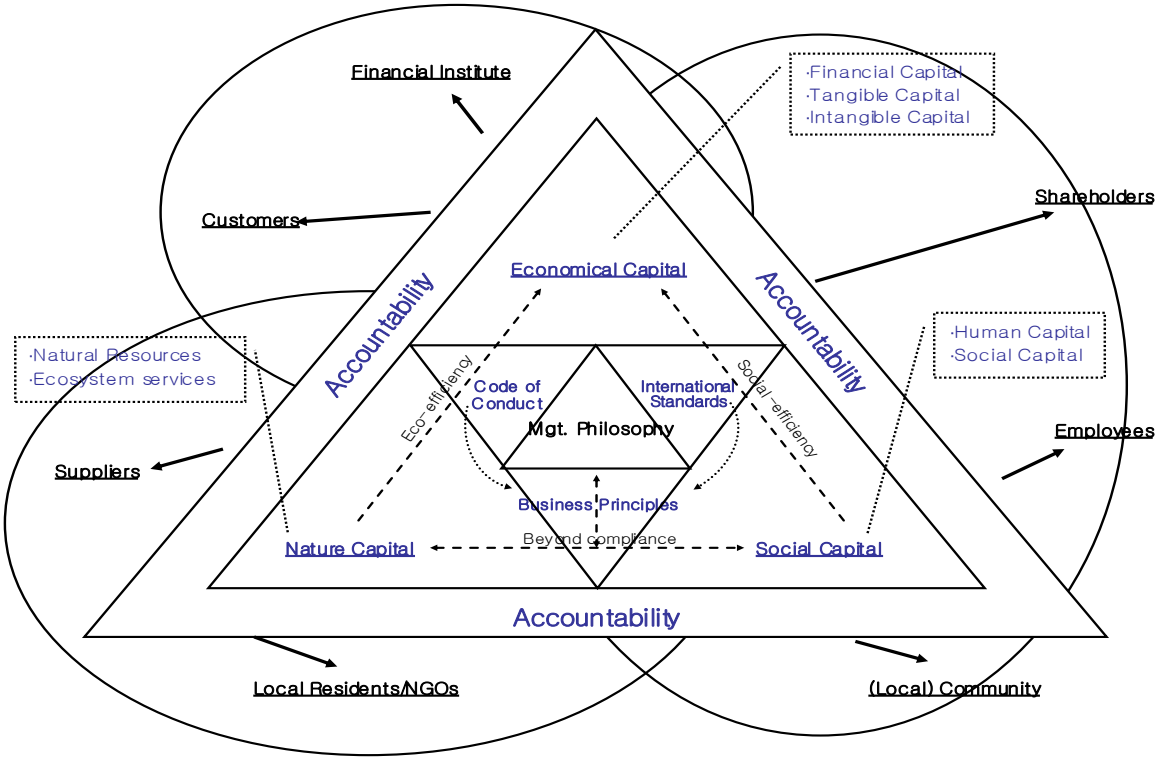
business ethics or codes of conduct should be considered as the minimum level for the firms.

· Three capitals – economic, natural, and social – should be integrated harmoniously into, a firm's decision making process and should be measured as a type of eco- and social – efficiency aiming at performance that is beyond compliance.

· Corporate accountability requires the verification of TBL activities implemented by third parties for transparency and objectiveness. However, it should be conducted on a voluntary basis.

· According to stakeholder theory, shareholders are one of the multiple stakeholders. (Clarkson, 1995a; Donaldson and Preston, 1995; Jones, 1995; Mitchell, Agle and Wood, 1995; Wood and Jones, 1995). Therefore, managers should be considered in the firm's decision making process. In figure 4.8, the following eight types of stakeholders are highlighted; shareholders, employees, the community/government, neighbors and NGOs, suppliers, customers, and financial organizations. That is to say, corporate value of sustainability management presuppose a relationship with multiple stakeholders, e.g., a partnership or engagement in order to decrease the risk generated by stakeholders and enhance firm's accountability or transparency.

Figure 4.8 Strategic Frameworks for Corporate Sustainability Management



· In this dissertation, normative relationships between a firm and its stakeholders are not considered based on the concepts and definition of corporate sustainability management. Figure 4.8 can be used as guidance for strategic CSM framework that based on business principles, management philosophy including sustainability which organizations should be linked with the three capitals – economic capital, natural capital, and social capital. A firm should pursue strategic options for each of these three

capitals by systematically seeking to go beyond compliance based on management philosophy and objectives through the activities and results of sustainable activities of the firm. The performance should be measured as a type of eco-efficiency and socio-efficiency and should be verified and assured by independent and publicly trusted third-party organizations. Finally, a firm should maintain sound relationships with stakeholders who are related to its operations.

4.6 Summary and Conclusions

Chapter 4 focused upon the definition of CSM (see section 4.3). It also focused upon selecting the core CSM indicators (see section 4.4) and driving forces (see section 4.5) for firms to achieve TBL performance in the economic, environmental, social dimensions of its operations. The author of this dissertation developed the "Corporate Value Matrix for Sustainability (CVMS)," in order to serve as the foundation for performing the three case studies, the results of which are presented in Chapter 5.

The author of this dissertation is convinced that, with regard to the purpose of a firm and the concept of management, CSM is the most suitable for helping firms to achieve and maintain sustainable competitive advantage, and for ultimately contributing to societal sustainable development. The concept and definition of CSM should be understood and applicable to the strategic management of firms. Therefore, the author of this dissertation presents "The Strategic Framework of Corporate Sustainability Management" based upon definitions and driving forces of each indicator. A summary of Chapter 4 is presented in the following paragraphs:

- CSM is an evolving concept that managers are adopting as an alternative to the traditional growth and profit-maximization model. It can be defined differently in line with the understanding regarding the purpose of the firm, point of view about sustainability or sustainable development and position about four pillars (environmental management, corporate social responsibility, stakeholder management, and corporate accountability) on the root of CSM (see Chapter 4). Furthermore, it is often used in conjunction with, and in some cases as a synonym for, other terms such as "sustainable development", "corporate social responsibility" and "corporate citizenship" etc. In particular, ethical management has been used as a synonym for sustainability management of a firm in Korean business circles. In order to understand the purpose of a firm, and its subsequent terminologies including sustainability, CSM is defined in this section.
- Sustainable development, environmental management, corporate social responsibility, stakeholder engagement and accountability are the five pillars of CSM;
- The five pillars were examined from an historical perspective through the findings and recommendations of researchers in this field. Based on the analysis of the purpose of a firm and the concept of management, terminologies that are used for sustainable development in the business world were analyzed from strategic management perspectives.

- In the course of the terminologies analysis, CSM, including corporate citizenship and business ethics were found to be crucial, considering that the relationships between the firm and the society are increasing in importance. This is global trends. Because the definition is very ambiguous however, a wide range of approaches such as general and normative approaches are used, focusing on business ethics. This may lead to confusion and misunderstanding about the purpose of a firm and, as a result, it may cause the relationship with NGOs to be more inconvenient. The meaning and image of 'responsibility' itself is not suitable with the purpose of a firm based on contractual obligations and strategic management. Stakeholder approaches are also separated into descriptive/instrumental approaches and normative approaches. Therefore, when a firm reflects upon stakeholder engagement, approach methods must be considered as well. Thus, the concept and definition of CSM was selected based on the relationship and analysis of these kinds of terminologies. This was accomplished by taking the concept of sustainable development, the purpose of a firm, the meaning of management and the relationship with strategic management, and corporate sustainability management that are suitable for a firm. As a result, CSM was defined based upon the three capital-based approaches presented in section 4.2.7.
- In order to select the driving forces based on the definition of each indicators, the author examined the literature written by a series of researchers and consultants (Barney, 1991; Grant, 1991; Hart, 1995; Teece, Russo and Fouts, 1997; Carroll, 1999; Sustainability, 2001; T. Dyllick and K.Hockerts, 2002, Thorpe and Prakash-Mani, 2003), and analyzed the evaluation criteria of the main rating institutes (SAM-DJSI, FTSE4Good, Domini 400) including the GRI (See Table 4.7 in section 4.3.2 and appendix A).
- Finally, the 'corporate value matrix for sustainability' based on the collection of evidence on the BCS and broad recommendations for action (see section 4.4) will be useful for helping firms to develop and evaluate their strategic planning for CSM. History of sustainability management of Korean business circles is not very long ; that is to say, it has been just two years since sustainability management was implemented in Korean business circle. It means that the data for analysis are not enough for a case study of the dissertation. However, the matrix/model established in this Chapter together with the criteria presented in Chapter 2 can be applied for case study.
- The Chapter 5 will present the case study results as a type of 'sustainability possibility frontier curve (see Chapter 5 for more detail)' presented in order to measure the degree of the improvement in sustainability perspectives. The author of this dissertation examines strategic positioning based upon the IO theory of Porter and simultaneously investigates the possibility of whether the 'sustainability frontier curve' goes up or not by a wide range of activities carried out by Korean companies. In order to enhance corporate value by CSM, all the activities of CSM should be carried out systematically based on the strategic framework in the Plan-Do-Check-Act cycle. Thus, The author in this

dissertation presents a strategic CSM framework linked with Plan-Do-Check-Act cycle (see figure 4.8) in order to improve corporate value measured based on "Corporate Value Matrix for Sustainability (CVMS)," established on the CSM definition basis. That is to say, the CSM philosophy should be based on and should integrate the three capitals – economical capital, natural capital, and social capital. Firms should pursue strategic options for each capital to systematically proceed beyond compliance based on management philosophy and in order to achieve TBL's objectives for all three capitals. Business principles play important roles in the strategic sustainability management framework as the principle of strategic activities. The results of sustainable activities of firms should be measured as a type of eco-efficiency and socio-efficiency and be verified and assured by independent and publicly trusted third-parties. Finally, a firm should maintain the relationships, e.g. a partnership or engagement with stakeholders who are related to its operations. Such an activity will be on the basis of corporate accountability or transparency. Even though its framework was provided as an ideal level, it will be helpful as one of references to set up strategic CSM framework in order to implement CSM systematically.

- To conclude, various terminologies for achieving sustainable competitive advantage such as environmental management, corporate social responsibility, corporate citizenship, and corporate sustainability have been developed. Just as sustainable development was defined on the basis of the integration of economy, society, and environment by Gladwin et al. (1995) and WBCSD (2000). Particularly, the definition of sustainable development based on three basic principles (see section 4.2.2), and understanding of the concept of strategic management make the difference among terminologies used in business circles in order to achieve sustainable development more clearly and accurately than ever. That is to say, corporate sustainability management is the most suitable for a firm and should be defined based on a capital-based approach focusing on stakeholders including shareholders. In this regard, the key capitals and their driving forces are identified on the basis of the analysis regarding arguments of some researchers and criteria of rating institutes including GRI and a model for case study was developed. Additionally, based on the definition and direction of corporate sustainability management, a appropriate strategic framework is presented. These are the solutions to *Research Question 1*.

However, not all companies currently subscribe to CSM for sustainable development, and it is unlikely that they all will, at least not voluntarily. But, it would be better terminology for sustainability management for a firm in strategic management perspectives, taking account of the concept and definition of five pillars for CSM. In fact, a significant number of companies have made public commitments to environmental protection, social justice and equity, and economic development. Their numbers continue to grow. This trend will be reinforced if shareholders and other stakeholders support and reward companies that conduct their operations in the spirit of sustainability.

CHAPTER 5. CASE STUDIES

5.1 Introduction

Chapter 2 has provided the theoretical perspective designed to enhance corporate value from a sustainability perspective and to achieve sustainable competitive advantage (see Figure 2.5 and 2.6). This dissertation author has also developed and presented the evaluation criteria for the empirical study (see Figure 2.7). Similarly, Chapter 4 contains the model for the empirical study based on the definition of corporate sustainability management and the analysis of the driving forces for CSM (see figure 4.6). In this chapter, the results of the three case studies are presented. The results provide answers to research questions 2 and 3.

RQ2: Is the direction of corporate sustainability strategy in Korean companies appropriate for sustainable growth of the companies?

RQ3: Why have Korean companies tried to integrate sustainability into corporate strategy?

This dissertation author conducted two kinds of empirical studies. The first was related to research question 2. The research was designed to obtain evidence as to whether or not the sustainability strategy of Korean companies is appropriate for corporate sustainable competitive advantage in social investment and resource-based perspectives. The second kind of empirical study was related to research question 3. Through a comparison between a beginning point in 2002 and the current situation (2004) within the three case study companies, their progress along the sustainability frontier curve was used to measure their progress.

Three case companies were included in the empirical study. One is a Korean electronics company (Samsung SDI), the other is a Korean automobile company (Hyundai Motor), and the last is a Korean steel company (POSCO). These are global companies which declared sustainability management in 2002 and periodically publish sustainability reports. In this section, all sustainability activities of these three companies will be analyzed based on a theoretical perspective and evaluation criteria. It is shown whether they have an impact on economic capital including company's financial performance while considering to the external business atmosphere, and as well as the gap between corporate value in 2002 and 2004.

Section 5.2 presents the case study design. It explains how the case study was carried out. Section 5.3 is the main part of this dissertation. It is the result of the empirical study. It characterizes the gap between the demands of the external business atmosphere and the three companies' real sustainability activities. It also presents the gap of crucial sustainability factors between the result of SAM DJSI and employees' awareness of Korean companies based on an empirical study. Furthermore, it presents the results as a type of 'sustainability frontier curve' according to the sustainability activities of the three

companies over three year period (between 2002 and 2004).

5.2 Case Study[92] Design

Every empirical study has an implicit, if not an explicit, research design. A research design should be the logic that links the data to be collected (and the conclusions to be drawn) to the initial questions of a study and the theoretical perspective. Case studies in this section of the dissertation can be defined as an explanatory case study (Yin, 2003). The author of this dissertation developed a theory prior to the collection of evidence for the case study (See the Chapter 2) based on reviewing the relevant literature and discussing the dissertation idea with a local adviser and supervisor. In addition, the author of the dissertation established a model to solve three research questions (See Chapter 4). This model provides the guidance in determining what data to collect and the strategies for analyzing the data.

In order to seek to answer the research questions and objectives, three cases are the subject of this dissertation. These cases represent unique and typical cases in Korean business circles; they are also longitudinal. In Korea, corporate sustainability management is in the infant stages and therefore, the three companies of the dissertation – Samsung SDI, Hyundai Motor, and POSCO – have announced that they will drive CSM and globalization, and have published sustainability reports regularly since 2003. Each firm is also the representative of its industry in Korea and in the world. Therefore, single-case-design is also applicable for analysis of this dissertation. However, the multiple-case-design, if possible, provides more internally valid and reliable results than the single-case-model. When using multiple-case design, a literal replication case study, where research results can be driven from the theory applied in research, is more helpful than a theoretical replication case study (Yin, 2003). The author of this dissertation sought to infer results based on the theory presented in Chapter 2. When analyzing a firm's inner compatibilities, the dissertation was carried out for only one Korean company, because the other two companies did not want to divulge relevant information. The unit of analysis, in this dissertation, is the single or holistic case, which focuses on sustainability strategy at the corporate level.

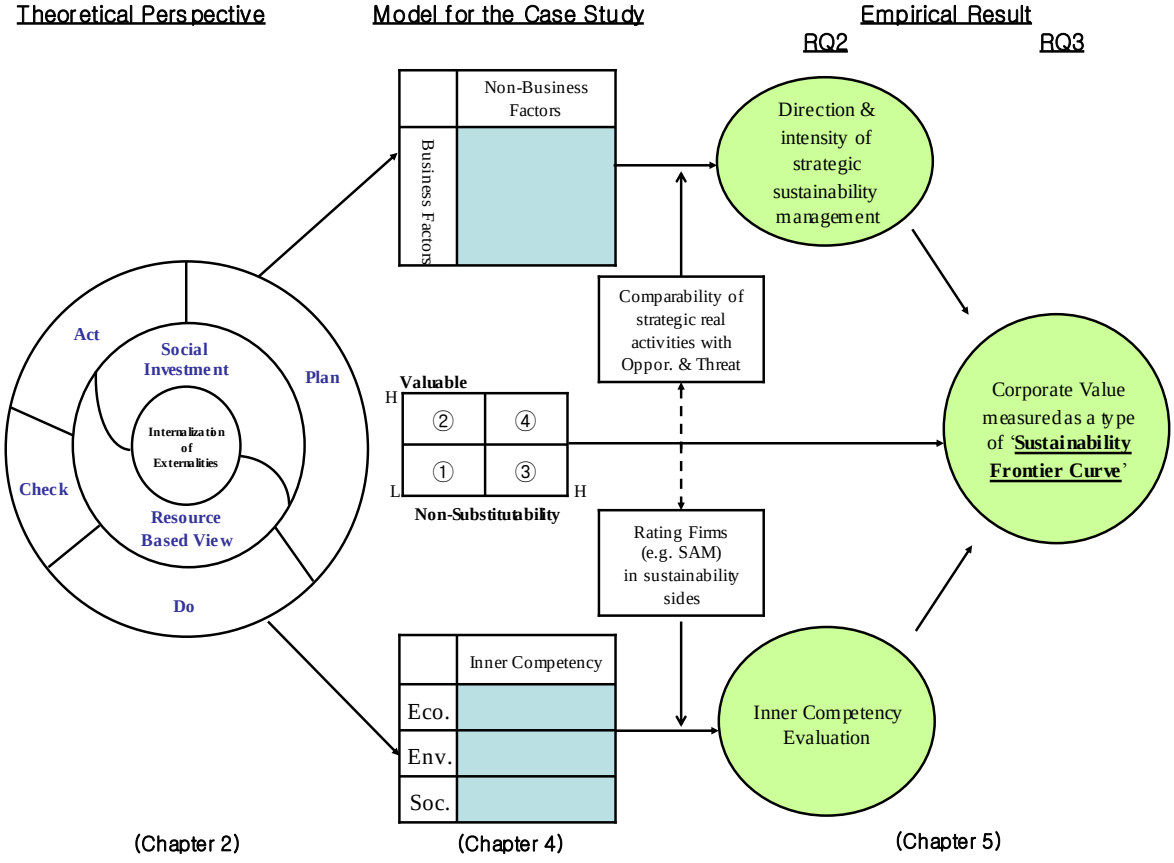
Data analysis consists of examining, categorizing, tabulating, or otherwise recombining the evidence to address the initial propositions of the study. Analyzing case study evidence is especially difficult because the strategies and techniques have not been well defined. Nevertheless, every investigation should start with a general analytic strategy – yielding priorities for what to analyze and why. Within such a strategy, five dominant analytical techniques should be used: pattern-matching, explanation-building, time-series analysis, logics model, and integration of cases, are dominant methods. Each is

[92] For case studies, four major types of designs are relevant, following a 2*2 matrix. The first pair of categories consists of single-case and multiple-case designs. The second pair, which can occur in combination with either of the first pair, is based on the unit or units of analysis to be covered – and distinguishes between holistic and embedded designs. The case study investigator also must maximize four aspects of the quality of any design: (a) construct validity, (b) internal validity (for explanatory or causal case studies only), (c) external validity, and (d) reliability (Yin, 2003, 1994).

applicable whether a study should consider these techniques. Other types of analytical techniques are also possible but deal with special situations – namely, in which a case study has embedded units of analysis or in which there are a large number of case studies to be analyzed. These other techniques should therefore, be used in conjunction with the five dominant techniques and not alone (Yin, 2003, 1994).

The case study results were analyzed based on the logic model (See Chapter 4), which is a combination of pattern-matching and time-series analysis. Cases observed empirically were matched with cases projected theoretically (Yin, 2003). Figure 5.1 summarizes the flowchart of empirical study of this dissertation considering the theoretical perspective.

Figure 5.1 Flowcharts of case study of the dissertation



Case studies in this dissertation were constructed using a wide range of sources such as: documentary information like reports analyzed by researchers, research institutes, and consultancies and each firms' sustainability reports, presentations materials, semi-structured interviews with each companies including structured survey, each firms' website, and news opened in the Korean Stock Market including Korean daily and economy newspapers. All sources of evidence were reviewed with key persons of each firms' sustainability team, so that the case study's findings were based on the synthesis of information from

different sources. This makes conclusions more reliable and convincing based on crosschecking the data obtained from multiple sources of evidence and findings (Yin, 2003). In order to provide a representation of a mass of complex textual material, all activities of each case organization have necessarily been simplified and the main activities related to the research objectives of the dissertation have been carefully evaluated in compliance with the criteria of the dissertation.

Several informal conversations were held with managers and team members from the three companies' who served as the primary references during the whole period of investigation. At the same time, formal meetings with three companies were held three times with each company during that period. However, in the case of POSCO, these meetings were held more frequently. In particular, without the help of the POSCO CSM (corporate sustainability management) team, the survey for identifying and investigating the competency of POSCO could not have been conducted (See Table 5.1). The author of this dissertation works for the POSCO Research Institute (POSRI), which supports the strategy of POSCO. Therefore, the author of this dissertation was allowed to attend internal meetings or presentations that were inherent to the strategic directions or options and for the improvement of employees' competency of POSCO for its sustainability management. A number of hours were spent interviewing, discussing and attending meetings held at the case study companies.

Table 5.1 A Korean steel firm's employees surveyed for analyzing the competency of its SM

Division	No of Employees Surveyed	No of Responding Employees
Headquarters	174 (2 persons/team, 87teams)	68
Pohang Steel Works	90 (2 persons/term, 45teams)	12
Gwangyang Steel Works	82 (2 persons/team, 41teams)	14
Total	352	94 (response rate: 27%)

Note: Employees surveyed from each team included are the team leader and the most senior member in the team.

In addition, since 2003, the author of this dissertation has been designated as an adviser of the project supply chain environmental management for sustainability at Hyundai Motor. Therefore, he has participated in formal meetings organized by its sustainability team twice a year. He has obtained fruitful information, and additionally was able to hold informal meetings frequently for the purposes of this dissertation. Table 5.2 summarizes the activities conducted during the period of investigation. Even though WBCSD, GRI, UNEP FI, SAM, EILiS, SNS Bank, and Shell are not case study companies in this dissertation based on the logic model, the author of the dissertation visited and had a meeting with managers at these institutions. These kinds of meetings were highly helpful to understand the trend of international societies. In particular, the manager at Shell provided key insights regarding ways to consider sustainability in a strategic management perspective. Unfortunately, the dissertation could not include a case study for Shell because its industry is different from the industries of Korean companies examined in this dissertation.

Table 5.2 Summary of Field Study Activities

Firm	Period/Date	Location	Activity/Theme
Samsung SDI	February, 2004	Headquarters	Interview with three managers
	July, 2004	Headquarters	Interview with a manager and a team member
	April, 2005	Headquarters	Interview with a manager and a team member
	October, 2004	POSRI	Interview with two managers
	December, 2004	Telephone	Interview with a manager
	February 15, 2005	POSCO Headquarters	Meeting with team leader of three companies and presentation related to the dissertation
	March, 2005	POSCO Headquarters	Interview with two managers
	October, 2005	E-mail	Comments on state of the arts analysis
	December, 2005	E-mail	Comments on reliability data collected
	January,2006	Headquarters	Discussion on the result of case study
Hyundai Motor	October, 2003	Headquarters	2003 Midterm Workshop of SCEM Project of HM/ Data Collection
	April	Headquarters	Interview with a manager /Data collection
	May	Headquarters	Interview with a team member of Sustainability Team
	June, 2004	Headquarters	2003 Final Workshop of SCEM Project of HM/ Data Collection
	August, 2004	Headquarters	Interview with two managers/ Data Collection
	October, 2004	Headquarters	Interview with three team members
	December, 2004	Jeju Island, Convention Center	2004 Midterm Workshop of SCEM Project of HM/ Data Collection
	February 15, 2005	POSCO Headquarters	Meeting with the team leader of three companies and presentation related to the dissertation
	April	Headquarters	Interview with two managers
	June, 2005	Headquarters	2004 Final Workshop of SCEM Project of HM/ Data Collection
	October, 2005	E-mail	Comments on state of the arts analysis
	January, 2006	Headquarters	Discussion on the result of case study
POSCO	January, 1994~Present	Environmental Planning Department in Headquarter	Implementation of many environmental management projects of POSCO/ Data collection (focusing on environmental sustainability)
	January, 2004~Present	Corporate Sustainability Management Team in Headquarter (newly established in 2004)	Implementation of three projects related to the sustainability strategy, report, e-learning program etc./Data Collection
	May, 2004	Human Development Center in Pohang	Workshop and presentation on key issues of strategic sustainability management
	July, 2004	Human Development Center in Pohang	Presentation about criteria of key rating institute including GRI/ Discussion
	March, April, & May 2005	Headquarters	Discussion on key criteria for strategic sustainability management /Data Collection
	June 2005	By Electronic System of POSCO	Conduct Survey for identifying and investigating the inner competency of POSCO

Arcelor	March 2003	Paris	Discussion on Arcelor's sustainability Activities, mainly environmental activities
	August 2003	Pohang	Invitation presentation of Arcelor Vice President regarding its sustainability management approach
Philips	September 2005	Headquarters, Eindhoven	Interview with Vice President in charge of sustainability department and Discussion on Philips' sustainability strategy
Shell	September 2004	Haag	Interview with director and two managers and discussion on its sustainability strategy and barriers
GRI	June 2002	Amsterdam	Interview with tow managers and discussion on terminologies for corporate sustainability
	March 2005	Amsterdam	Interview with a director and two managers and discussion on GRI indicators and direction of G3
WBCSD	March 2005	Geneva	Interview with six researchers of each part and discussion of key activities for sustainability
UNEP FI	March 2005	Geneva	Interview with team leader and two workers/Data Collection for sustainability criteria
SAM	March 2005	Zurich	Interview with analyst in steel industry and discussion of criteria of SAM
EIRiS	June 2002	London	Interview with CEO and a manager and discussion on its criteria and approach
SNS Bank	September 2004	Amsterdam	Interview with sustainability team leader and discussion on business case

The empirical study of each firm has been carried out based on indicators in detail presented in the model for this dissertation (See Figure 4.6 and 4.7 in Chapter 4). The firm's activities regarding each case study factor were evaluated in accordance with the criteria in Figure 2.7. The evaluation was carried out considering positioning and efficiency based on the capabilities in accordance with the profit maximization principle. The criteria in Figure 2.11 reflect this kind of conceptual approach. The following are examples of criteria that will be applied to each indicator for the case studies. Examples in Table 5.3 were prepared based on the driving forces of non-business sectors in Section 4.5.

Table 5.3 Examples of Case Study according to the criteria

Indicator		Examples	Criteria
Economy	Governance & Management	Established a mission statement, business principle, value and ethics, code of conduct around sustainable development performance including policies or codes of conduct on bribery and corruption, human rights etc.	①
		Accounting and verification carried out by recognized and independent firms (if possible, international firm) in accordance with ISAE 3000 including highest national standards	②
		Build specific structure and responsibilities for SD issues at the highest levels within the company (i.e. top-level responsibility as sign of commitment) and align incentives and pay systems with SD commitment and policies	③
		Favor openness and transparency about activities except where commercial confidentiality is absolutely necessary	④

	Principle of Profit Flow	Implicitly own its principle of profit flow, mainly on internal and economic stakeholders like management etc.	①
		Explicitly own its principle of profit flow, however focusing on internal and economic stakeholders such as management and employee, shareholder etc, and regularly implement the principles of profit flow.	②
		Establish and, if possible, implement the principles or direction of its profit flow for crucial stakeholders who contributes to its sustainable development or financial performance, however, it does not open to all the stakeholders.	③
		Measure how it generates wealth and employment and how it is distributed (ex, wages, share ownership, dividend, taxes etc) / Open and implement the principles or direction of its profit flow for crucial stakeholders who contributes to its sustainable development or financial performance	④
	Stakeholder Engagement	Irregularly provide information, particularly when a certain issue is proposed or an accident is sprang etc.	①
		Provide public information on its sustainable development – environmental, social and economic – performance, principles and policies through meetings and communication with stakeholders	②
		Regularly produce a public report with verification and assurance by third party	③
		Form a partnership considering firm's features and atmosphere and regularly discuss its sustainable development issue with its partners	④
Environment /Nature	Pollution Prevention	Control the process for target at a level of compliances	①
		Work with suppliers to ensure common standards of environmental performance	②
		Incorporate environmental considerations in selecting law materials and new sites, and in closing existing sites	③
		Change/develop processes protecting the environmental such as: · Use less materials (including raw material and water use) · Use less energy overall (and greater proportion from renewable energy) · Reduce use and dispersion of toxic substances · Reduce waste and emissions to air, water and land, including greenhouse gases · Reduce their impact on the local environment – natural habitat and bio – diversity · Minimize use of transportation in production · Enhance the recycle ability of by-products	④
	Environmental Friendly Product	Advertise environmental benefit of its products without any labeling system recognized by national or international standards.	①
		Adopt advertising and labeling practices reflecting economic, social and environmental concerns based on national or international standards.	②
		Assess products and services at different stages of production, use and disposal based on social and environmental considerations.	③

		Develop new products or services specifically to improve its environmental, social or economic impact, and integrate environmental, social or economic factors into product/service design and delivery; considering materials and input used recycle ability of product, maximizing product life, etc./ Involve key suppliers including the community in the review and design of products/services and involve key customers in product servicing, maintenance and disposed which takes into account sustainable development issues	④
	Environmental Awareness	Irregularly, activities conducted for enhancing environmental awareness, particularly when environmental issues were provoked.	①
		Activities for enhancing environmental awareness, considering the features of companies and industry. However, employees related to environmental job mainly participate in the activities.	②
		Activities for enhancing environmental awareness, considering the features of companies and industry (all employees participate).	③
		Activities for enhancing environmental awareness, considering the features of companies and industry, all employees, especially corporate planning department.	④
Society	Human Resource Management	Provide equal opportunities and maintain labor force diversity with respect to gender, religion, ethnicity, age, etc.	①
		Ability to attract and retain employees and to increase staff satisfaction and employee motivation	②
		Provide training and skill development of labor force to help them perform better, get promoted or find alternative employment in cases of redundancies, ultimately increased employee empowerment and ability to innovate	③
		Consultation and engagement activities that proactively address problems, leading to new innovations	④
	Labor Practice/ Human Right	Respect regulation working hours and payment for overtime	①
		Develop labor practices around human rights (including child and force labor), firing/redundancy and disciplinary measures in compliance with international standards and suitable for local conditions	②
		Pay fair wages compared to the national average, and provide basic benefits (e.g. staff health and pension plan)	③
		Provide health and safety protection, enhancement and training for workforce, including subcontracted labor	④
	Socio-Economic Development	Supporting heritage, art and culture, and invest in basic need projects around health, education, water, sanitation, etc. through donations in cash, kind or man-hours, particularly investment which: · Involves affected groups – civil society, government, communities – in ownership and responsibility for projects · Involves participatory project planning, monitoring and evaluation · Is part of a strategic program based on development needs and impacts · Prioritizes vulnerable or marginalized groups (indigenous people, single family heads, women) · Will become self-sustaining beyond the company's involvement	①

		Invest in infrastructure to support economic developments, e.g. water supplies, roads, power, telecommunications	②
		Contribute to training and sharing of technology, management techniques and standards with local suppliers, especially SMEs and marginalized (especially those displaced by setting up of the factor etc) or under-represented groups, as well as other actors such as government and NGOs	③
		Investing activities considering the features of firm and industry, namely utilizing the opportunities and neutralizing the threatening, ultimately creating sustainable competitive advantage and greater social value.	④

Source: Rewritten based on Thorpe and Prakahh-Mani (2003) and examples evaluated based on the criteria by this dissertation author (figure 2.7).

5.3 Results on Sustainability Analysis for Key Korean Industries and Companies

The case study in this section was carried out to identify external sustainability factors of three companies, respectively one in the following industrial sector: electronics, automobile and steel and the relevance of sustainable activities implemented by the companies in those industries that are leaders in the field of corporate sustainability management in Korea. In addition, this case study was designed to identify the linkage between traditional business factors and the three selected companies' sustainability-driven activities, in order to ultimately ascertain if their sustainability management will help the corporation make progress towards becoming more becoming sustainable industry. The results are presented as a type of sustainability frontier curve. The deliverables of this study are directly applicable and practical evidence that will help the strategic position and promote further understanding of corporate sustainability management. For each company, a case study was carried out in accordance with the criteria and CVMS model presented in Chapter 2 (see figure 2.7) and 4 (see figure 4.6).

5.3.1 External Sustainability Analysis of Key Korean Industries

1) Electronic Industry

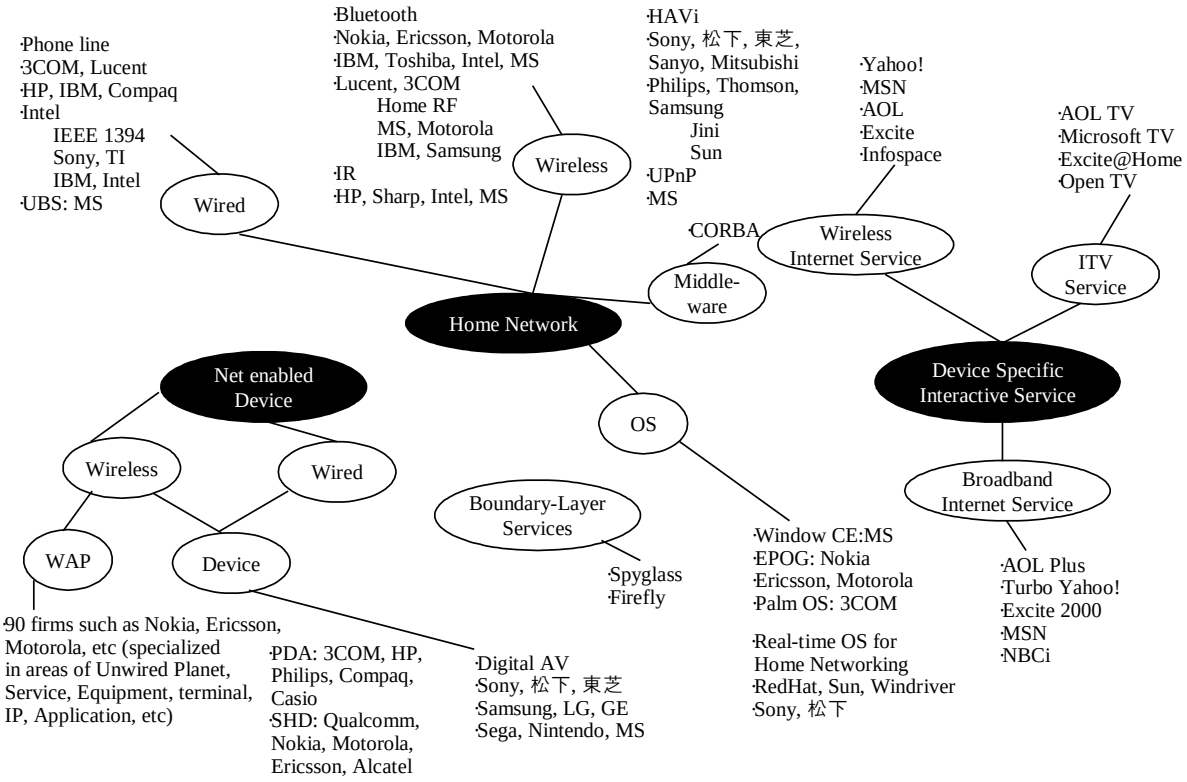
① Characteristics of Electronics Industry

The characteristic of the electronics industry, particularly, considering sustainability, consists of six factors:

- It is a high-tech industry which plays an influential and control in the core growth industry of the digital economy era. Display instruments, instruments for information and communication, and electronic parts have occupied a role of central importance in production perspectives. In particular, computer and communication instruments have recently risen rapidly due to digitalization and the internet boom.
- Its product cost is highly dependent on origin technology and standardization. In the case of high-tech

electronic products, 10%~20% of its manufacturing cost is composed of a patent fee. Business initiatives based on the standardization and preoccupancy of market-based technology competitiveness is highly imperative for sustainable growth of electronic companies. For these kinds of reasons, electronic firms have proactively driven forward strategic alliance and competitive relation among electronic companies in the world. Figure 5.2 presents strategic alliance regarding standardization in electronic industry.

Figure 5.2 Strategic Alliance and Competitive Relation regarding Standardization in Electronics Industry



Source: Samsung Research Institute (2004)

- Due to the rapid development of technology, the life cycle of its products, particularly digital goods like computers, and mobile telecommunication instruments, is relatively shorter than for traditional home electrical appliances like TVs, refrigerators, and air-conditioners.
- It is a capital-intensive industry. It requires large-scale R&D investments for equipment needed in order to improve the quality of existing products and parts as well as to develop new original high-tech technology. For example, a certain company invested 1,200billion KRW (approximately, US$1.2billion) for one process line for a 5th generation TFT-LDC in 2002 and 2,400billion KRW (approximately, US$2.4billion) for one process line for a 6th generation TFT-LDC in 2005.
- It is susceptible to various environmental regulations, particularly regulations related to hazardous

substances and waste treatment due to a wide range of chemical components which its product contains. In practice, Waste Electrical and Electronic Equipment (WEEE) in 2005 and Restriction of the use of Hazardous Substances (RoHS, mainly, Pb, Ag, Cd, Cr^{6+} etc.) in July 2006 enacted by the EU based on IPP (Integrated Product Policy) will have a great influence on business behavior and decision-making for sustainable competitive advantage.

- It is very sensitive to business cycles in the world.

② Economical and Social Characteristics of Korean Electronic Industry

The electronic industry has been pursued as a next-generation growth engine industry by the Korean government. The digital electronics field, including digital TV broadcasting, displays and intelligent robots has been designated as a strategic area in the industry. It has established action tasks in five fields such as technology development, manpower cultivation, infrastructure creation, international technology cooperation, and system improvement. It has also adopted a localization policy of core electronic parts and materials, considering that it has a narrow domestic market and lacks capital, and depends heavily on Japanese parts and materials.

Its strategies are being achieved on schedule. In 2003, it was the world's fourth biggest producer of electronics, following only the United States, Japan and China. Its share of the global market reached 5.5% on production of US$64.03billion, higher than German's 4.0% and the United Kingdom's 3.2%[93]. Together with rapid technology development, global brand strategies of domestic companies have led to sharp increases in exports and greater awareness in Korean high-tech electronics products. As of 2005, Korea has a number of top 10 export items including semiconductors, mobile phones, CRT, digital TVs, TFT-LCDs, PDP, DVDP, MP3P, MWO, DVR, etc.

In addition to the expansion of exports, Korean enterprises are earning reputations for high technology products and for their potential as global partners. Several giants in the electronics industry like Sony of Japan have sought to expand strategic alliance, partnerships and collaboration with Korean leaders in respective fields like Samsung and LG Philips. The international electronics titans are also looking to increase price competitiveness by outsourcing to reduce production costs.

Its R&D investment reached 5.56 trillion won (US$4.31 billion) in 2002, up 14.6% over the previous year. In terms of the ration of R&D investment to turnover, it (5.20%) more than doubled to 2.19% of all industries[94]. This kind of large scale of R&D investment has been indispensable in its industry in order to cope with the rapid change of its technology.

In summary, the electronics industry is being pursued as a next-generation growth engine industry by

[93] *Yearbook of World Electronics Data* (2004)
[94] Korea Institute of Science & Technology Evaluation and Planning (2003)

the government and it has succeeded in obtaining a competitive edge in the world markets. Strategic alliances with international giants and large scale R&D investments have been carried out by Korean electronic companies.

Based on a strong industry-wide annual growth recently, it now accounts for more than approximately 35% (US$746.6 in 2003) of the nation's total exports. R&D investment doubled, more than half of patent applications (48,437 and 53.7% in 2003) were filled by all industries, and 18.4% (US$547 million in 2003) of the nation's total overseas investment[95]. There is no doubt that the electronics industry, a symbol of the nation's current industrial muscle and next-generation growth industry, has developed into a core strategic industry for Korea. In spite of the contribution of the industry, corporate governance, hazardous substances contained within products, labor practices (mainly, human resource management), particularly according to their globalization, etc of Korean electronics companies have been recently discussed by a wide range of stakeholders together with the emergence of their sustainable development efforts.

③ Environmental Characteristics of the Korean Electronic Industry

In the case of the electronics industry, environmental issues are more closely related to the use of electronic products, particularly energy consumption and recovery and treatment of waste products, than its manufacturing processes. In the EU, electronics product waste currently is treble of the total wastes discharged by EU, and without any intervention measures the electric and electronic product wastes will be 16~18% of municipal wastes in 5 years.

Meanwhile, hazardous substances contained in the products and pollutants emitted in the process have also burdened the environment

- PCB, Battery, Display (CRT, TFT-LCD, PDP), etc: Containment of Pb, Ag, Cd, Cr^{6+}, Br, etc
- Manufacturing Display: PFC (perflurocarbon, SF6, CF4, CHF3, etc), Acid(Hydrochloric Acid, Sulphuric Acid), Solvent, VOC, etc
- Use of Refrigerator and Air-conditioner: CFC

④ Technology trends in the Korean Automobile Industry

The technology of Japan in the area of home electronic appliances is currently dominant to that of Korea. However, the technology of five electronic products including instruments for mobile phone, display instruments, and CD-ROMs, are ranked first or second in the world. These electronic products have continuously been miniaturized or become bigger, mixed, and intelligent according to the development of technology. The following presents the technology trends for each area:

- Display: Replacement of CRT with flat display

[95] KEA(2004), *Annual Report* (www.gokea.org)

- TFT-LCD: A large scale flat display at more than 40 inches is the dominant technology. In the case of small sized technology, development of a cell phone can be changed into an ‘organic EL’ using organic matter.
- PDP: Large scale flat displays of more than 60 inches are the dominant technology
- Home Electronic Appliances: Emergence of new conceptual home electronic appliances that are digitalized, which are integrated with home electronic appliances, computers, communications, and broadcasting technology.

The development of digital technology and rapid diffusion of super-highway information networks etc have done away with the inherent area of traditional electronic products such as home electronic instruments, telecommunication instruments, and computers. The third generation mobile communication network like IMT-2000 can send and receive a large array of information wirelessly. The PDA integrated with PCs and communication, internet TV merged TV and communication, and Smart Phone combinations of PDA and cell phones, have complex and multiple functions.

There is little difference between Korea and other countries in research of electronic technology. However, whereas domestic research has mainly focused on manufacturing-technology, overseas research has run parallel with an environmentally-friendly manufacturing atmosphere and recycling methods.

⑤ External Sustainability Analysis of the Korean Electronic Industry

Table 5.4 and 5.5 provide the results of external sustainability analysis for the Korean electronics industry and they are displayed in Figure 5.3 as a type of CVMS to easily identify the linkage between traditional business factors and factors for CSM.

In the case of economic capital, stakeholder engagement is highly related to all the parts of business factors from both an opportunity and a threat perspective. Governance/management and profit flow as a driving force of economic capital may have an influence on access to capital and reputation/brand value. Three driving forces of nature capital impact revenue growth/market share, cost sharing and licenses to operate in business factors. This means that a wide range of environmental regulations without the discrimination of domestic laws and international standards have intensified rapidly to focus upon environmental quality of processes and products. Particularly, the IPP (Integrated Product Policy) principle established by the EU in 2001 and several acts related to it have dealt a decisive blow to business or environmental activities in the Korean electronic industry. Three driving forces of social capital have impacted upon cost savings/productivity and risk management in business factors. Human Resource Management and labor practices including human rights are closely related to reputation/brand value factors.

Table 5.4 Opportunities Analysis of Electronics Industry in Korea

Non-Business Factor		Title of Factor	Influence on CSM Driving Forces (Evaluation Result)
Economic Capital	Governance & Management	· Relatively, being improved awareness of international society regarding corporate governance of Korean companies	· Access to Capital, Reputation
	Information of Profit Flow	· Increased Demand for Profit or Benefit Sharing with the Companies	· Access to Capital
	Stakeholders Engagement	· Flourish of global economy · Gradual-recovering of domestic market · Gradual Improvement of rationale of stakeholders including shareholders · Firm infrastructure of IT Venture-Companies in Korea · Digitalization of electronic machine · A higher value-added of products · Leading world market in some parts or products (e.g. TFT-LCD, PDP, Unit for Mobile Telecommunication, etc · Proactive fostering industry policy of Korean Government · Maintaining the competitiveness of the existing electronic Industry · Transparency of non-financial performance including financial performance and, recently, concerns on evaluation of corporate activities in sustainability perspectives (Several Guidelines on environmental and sustainability Reporting)	· Revenue · Revenue · Risk Mgt. · Cost Saving, Risk Mgt. · Revenue · Revenue · Cost Saving, Risk Mgt. · License to Capital · Risk Mgt. · Access to Capital, Reputation
Nature Capital	Pollution Prevention	· Prompt Responsiveness of Korean Government according to business atmosphere for encouraging Korean industry in cleaner production sides · International and Domestic economic incentive tools like deposit, emission trading, etc.	· License to Operate · Cost Saving
	Environmental Friendly Products	· Increased Demand for environmental friendly Products	· Revenue, Reputation
	Environmental Awareness	· A wide range of education and training programs regarding environmental awareness · Awareness of Suppliers' Importance for coping with a wide range of regulations	· Cost Saving · Risk Mgt.
Social Capital	Human Resource Management	· Relatively, good quality of human resources	· Cost Saving, Risk Mgt.
	Labor Practice/ Human Right	· Enough experience with management system approaches through ISO 9000 series, ISO 14001, OHSAS 18001, etc · Integrating standards of social responsibility of ISO 26000 series in 2008 in management system perspectives	· Cost Savings, Risk Mgt., Reputation · Cost Savings
	Socio-Economic Development		

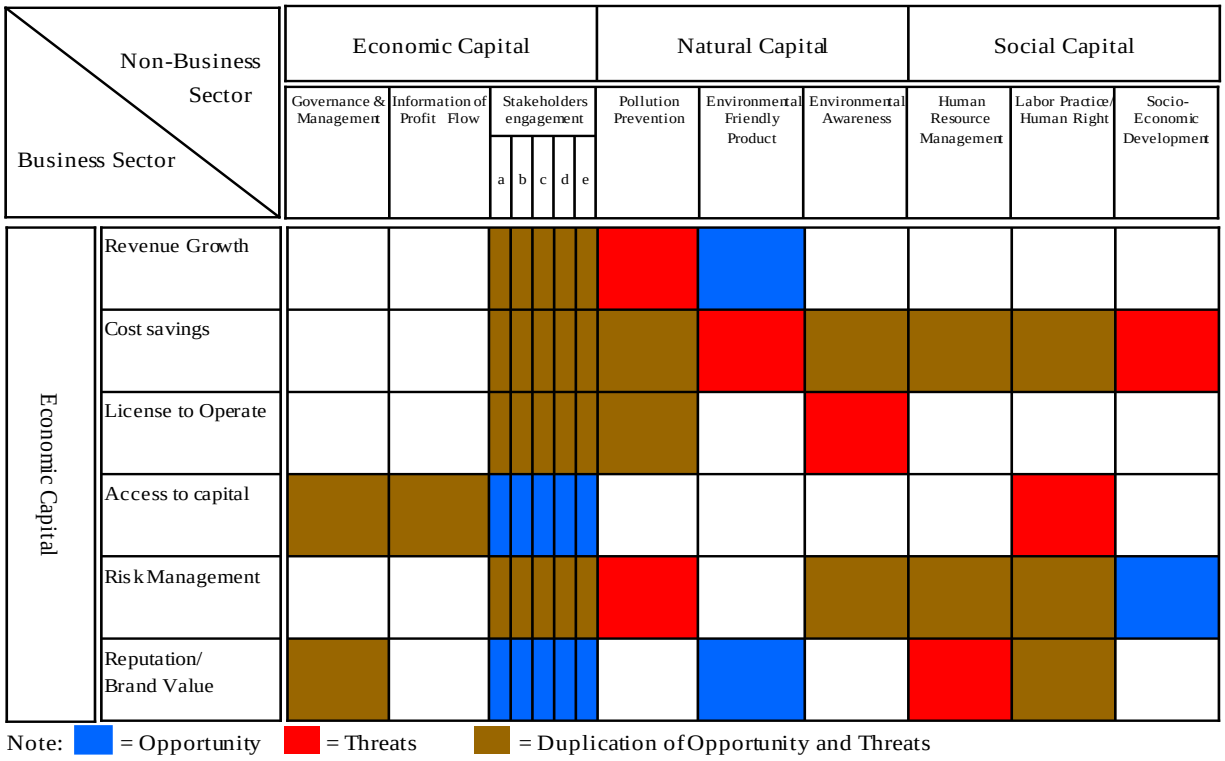
Note: 1) The number in the parenthesis reflects the impact on the financial performance.
2) Evaluation results are calculated by (∑evaluation by criteria/Total Number of Each Indicator) *Weighed Value (Total Number of Each Indicator/Total Number)

Table 5.5 Threats Analysis of Electronics Industry in Korea

Non-Business Factor		Title of Factor	Influence on CSM Driving Forces (Evaluation Result)
Economic Capital	Governance & Management	· Increased demands for transparency and Objectiveness of management in accordance with a wide range of international and domestic standards, Sarbanes-Oxely law, business ethics, etc	· Access to Capital, Reputation
	Information of Profit Flow	· Increased Demand for Profit or Benefit Sharing with the Companies	· Cost Savings
	Stakeholders Engagement	· World-wide Competitiveness Deepening · Regionalism and Block of EU, North America, etc · A fast-growing Least Developed among Developing Countries (LDDC) like China, India · Acceleration of deindustrialization · More wide range of stakeholders and frequently, their unreasonable arguments regarding sustainability issues · Entry Barriers of Technology · Transparency of non-financial performance including financial performance and, recently, concerns on evaluation of corporate activities in sustainability perspectives	· Revenue, Risk Mgt. · Revenue, Risk Mgt · Revenue, Cost Savings · Risk Mgt. · License to Operate, Risk Mgt. · Revenue · Cost Saving
Nature Capital	Pollution Prevention	· International and Domestics regulations including conventions (e.g. Montreal Protocol, Kyoto Protocol, Stockholm Convention, etc) focused on products and substances based on IPP, especially RoHS, WEEE, REACH, etc · International and Domestic economic incentive tools like emission trading, etc. · Relatively Weak Envt'al Management in External Contractual Suppliers	· Revenue, Cost Saving, License to Operate · Cost saving · Cost Saving, License to Operate, Risk Mgt.
	Environmental Friendly Products	· Increased Demand for envt'al friendly Products	· Cost Savings
	Environmental Awareness	· Expansion of Awareness based on ethics or normative perspectives · Lower awareness regarding necessity of environmental management · Awareness of Suppliers' Importance for coping with a wide range of regulations	· Cost saving, License to Operate, Reputation · Risk Mgt. · Cost Saving
Social Capital	Human Resource Management	· Insufficiency of technological experts according to business atmosphere · Increased requirements for corporate social responsibility including various Guidelines such as Global Compact, MNCs Principle, International Standards	· Cost Saving, Risk Mgt. · Risk Mgt., Reputation
	Labor Practice/ Human Right	· Increased Demand for participation in Management · Increased requirements for corporate social responsibility including various Guidelines such as Global Compact, MNCs Principle, International Standards · International standards like SA 8000 etc.	· Access to Capital · Risk Mgt., Reputation · Cost Saving, Reputation
	Socio-Economic Development	· Proactive Social Activities of MNCs in global companies, especially in EU · Expansion of Approach based on ethics or normative perspectives	· Cost Saving, Reputation · Cost saving, Reputation

Note: The number in the parenthesis reflects the impact on the financial performance.

Figure 5.3 External Sustainability Analysis of Korean Electronics Industry



⑥ Actual Responses Analysis of Samsung SDI

Table 5.6 and 5.7 present the evaluation results of the Korean core electronic company in sustainability perspectives. The former shows the results of 2002 activities and the latter shows the results of 2004 activities.

Figure 5.4 provides the impacts of each activity implemented by a Korean electronic company on business factors in accordance with the criteria (See figure 2.7). First, activities in each driving force are evaluated in accordance with the criteria. Second, the results evaluated by items in the business factors are classified among the same category themselves and are added together. Third, they are divided by the total number of the same kinds of business factors. That is to say,

▪ Each Non-Business Factor = ∑ result of the same kind evaluated based on the Criteria / Total No. of the same kind of business factors

The CEO of a Korean electronic company (Samsung SDI) has recognized sustainability as a management philosophy and a way in which to grow continuously. However, most of their activities in economic capital have focused on the improvement of risk management and reputation/brand value than directly influencing cost savings/productivity and revenue grow factors. In spite of the importance of external sustainability factors (see figure 5.3), its responses, relatively, do not seem to be proactive enough to improve the performance of its business factors directly. Nevertheless, among all the activities

related to stakeholder engagement, some have strived to improve the cost and productivity proactively. However, the information and principles regarding its profit flow have not been clear. Activities implemented for economic capital might or should be intensified preferably in order to achieve sustainable advantage competitiveness for this Korean company. In particular, third party verification and assurance over its sustainability activities must be improved in order to enhance its transparency and objectivity.

Its responses regarding natural capital over the external sustainability factors of the Korean electronic industry are very relevant and, ultimately, have been contributing to its sustainable competitive advantage and continuous growth. They have focused on business factors such as revenue growth, cost saving/productivity, license to operate, and risk management which can have a direct impact on financial performance. Activities for pollution prevention and environmental friendly product, which should be reflected into strategic management as core factors for sustainable competitive advantage, have been given particular emphasis.

Its responses regarding social capital over external sustainability factors of the Korean electronic industry are suitable. They have mainly focused on the improvement of cost saving, risk management, and reputation/brand value, and some activities have directly strived to improve revenue growth. Because the time period in which corporate social responsibility in Korean industry became an issue considered in strategic management is relatively much shorter than that in western industry, its social activities for sustainability must be increased. Particularly, giving brightness to the visually challenged is the best of the sustainable activities considering the characteristics of a Korean electronic company and the arguments of Porter and Kramer (2002). The relationship between the company and society will be further expanded to target stakeholders in the future. Therefore, the social activities of a firm should be carried out in order to enhance its value according to the theory of this dissertation.

Taking it by and large, the strategic activities of the test Korean electronic company are suitable for maximization of its opportunities and neutralization of its threats based on the external sustainability analysis. In particular, R&D activities in stakeholder engagement of economic capital, and pollution prevention and environmental friendly product activities of natural capital, which are judged as the best preference based on external sustainability analysis of electronic industry, have contributed to achieving sustainable competitive advantage in the global market. Furthermore, a strategic framework for sustainability management has been well revised and has inserted its management principle between its management philosophy and strategic options. The author of this dissertation argues that management or business principles are imperative considering a wide range of principles, standards, and stakeholders related to corporate sustainability management (See Chapter 4). However, many activities must be intensified continuously for sustainable growth. Particularly, some activities for enhancing economic capital must be revised. First, it must conduct stakeholder analyses regularly, and then on the basis of the

accurate identification of its stakeholders and their needs, its sustainable strategic options should be chosen. Perhaps, stakeholder analysis itself will enhance its transparency and objectiveness. Then, information or the principles of its profit strategy should be presented to all stakeholders in a transparent manner. Finally, verification activities regarding its sustainability report must be improved as soon as possible. If it needs to create revenue or market share in the global market, if possible, an internationally publicly trusted third party should conduct the verification and must obtain a management letter of 'assurance of its sustainability report'. In addition, its social activities which can directly improve its value, namely can be 'valuable and rare' activities, which reflect the characteristics of its business, should be continuously strengthened, even though its many activities are relatively good compared with the term which its sustainability management was proactively considered.

Table 5.6 Sustainability Activities Evaluation Result of Samsung SDI in 2002

Non-Business Factor		Title of Activity	Contribution to Sustainability Frontier Curve (Evaluation Result)
Economic Capital	Governance & Management	· CEO Message: Shareholder-oriented management and continuous economic growth, Reduction of environmental pressure for a sustainable earth, Strength of partnership with all stakeholders for win-win	· Revenue, Risk Mgt., Reputation (③)
		· Strategic Framework: Business Philosophy and 7 Values (Vision, Customer, Quality, Innovation, Communication, Competency, Integrity)	· Reputation (②)
		· Ethic Policy: Ambiguous Role in Strategic Framework	· Risk Mgt., Reputation (①)
		· Board of Director: 8 in total directors (4 Internal/ 4 External)	· Access to Capital, Risk Mgt(②)
		· Sustainability Management Structure: SM office and Sustainability Committee	· Risk Mgt.(③)
	Information of Profit Flow	· Employees(Just No of employees), Suppliers(Amount of purchasing parts and services from the outside), The Government(Tax), The public(Amount of Donations), Shareholders(Variation of its share prices)	· Access to Capital, Reputation (①)
	Stakeholders Engagement	· Shareholder and Investor: Facility investment and product development	· Risk Mgt. (②)
		· Suppliers: Sustainable supply chain management (Supplier selection and evaluation based on sustainability, Cooperation to strengthen supplier competency, Fair and open procurement)	· Cost Saving, License to Operate, Risk Mgt.(③)
		· Customers: Customer safety and information protection, Voice of Customers	· Risk Mgt. (②)
		· Public: A Clean Company by transparent and ethical management	· Risk Mgt. (①)
		· Communicating with local communities	· Risk Mgt., Reputation(②)
		· Environmental Audit and Independent Verification Report	· Access to Capital, Reputation (①)

Nature Capital	Pollution Prevention	· Pre-Environmental Impact Assessment System · Productivity Maximization with least Environmental Burden · PDP multi-panel technology	· License to Operate, Risk Mgt. (③) · Cost Saving, Risk Mgt. (③) · Revenue, Cost Saving (④)	
	Environmental Friendly Products	· Products and Technologies with Higher Environmental Values: CPT, CDT, STN-LCD → OLED, PDP, Battery, FED), particularly, World quality PDPs · A Green Supply Chain: Supplier Selection and assessment system, Green procurement, Hazardous Chemical List for Control	· Revenue (③) · License to Operate, Risk Mgt. (③)	
	Environmental Awareness	· Integrated Environmental Management (Environmental Life Cycle Approach): Procurement(Green Procurement), Development (DfE), Production (Cleaner Production Technology), Marketing (Environmental Marketing) · Green Communication: Eco-System protection program engaging stakeholders, Monitoring the surrounding environment, Internal Compliance, Voluntarily joining government-led environmental programs	· Cost Saving, Risk Mgt. (③) · License to Operate, Risk Mgt (③)	
Social Capital	Human Resource Management	· Vision for management by Talents · From joining the company to retiring: In-house college-building up technological capacity, Key resource nurturing program, Cyber training program, Career development and management – from entering to retiring	· Cost Saving (②) · Cost Saving, Reputation (②)	
	Labor Practice/ Human Right	· New labor and management culture: Trust and Cooperation, Participation and Communication, Sharing Business Results · Work – life Balance · Health and Safety · Diversity and human rights	· Risk Mgt. (②) · Reputation Value(②) · License to Operate, Risk Mgt. (②) · Risk Mgt (②)	
	Socio-Economic Development	· Giving brightness to the visually challenged · Matching Grant – Light of Love Fund · Encourage volunteer activities of employees · Community services to remind of company foundation motto	· Revenue, Reputation (④) · Reputation (③) · Reputation (②) · Reputation(②)	

Note: The number in the parentheses means the results from the activities of Samsung SDI were evaluated based on the criteria presented in Figure 2.7.

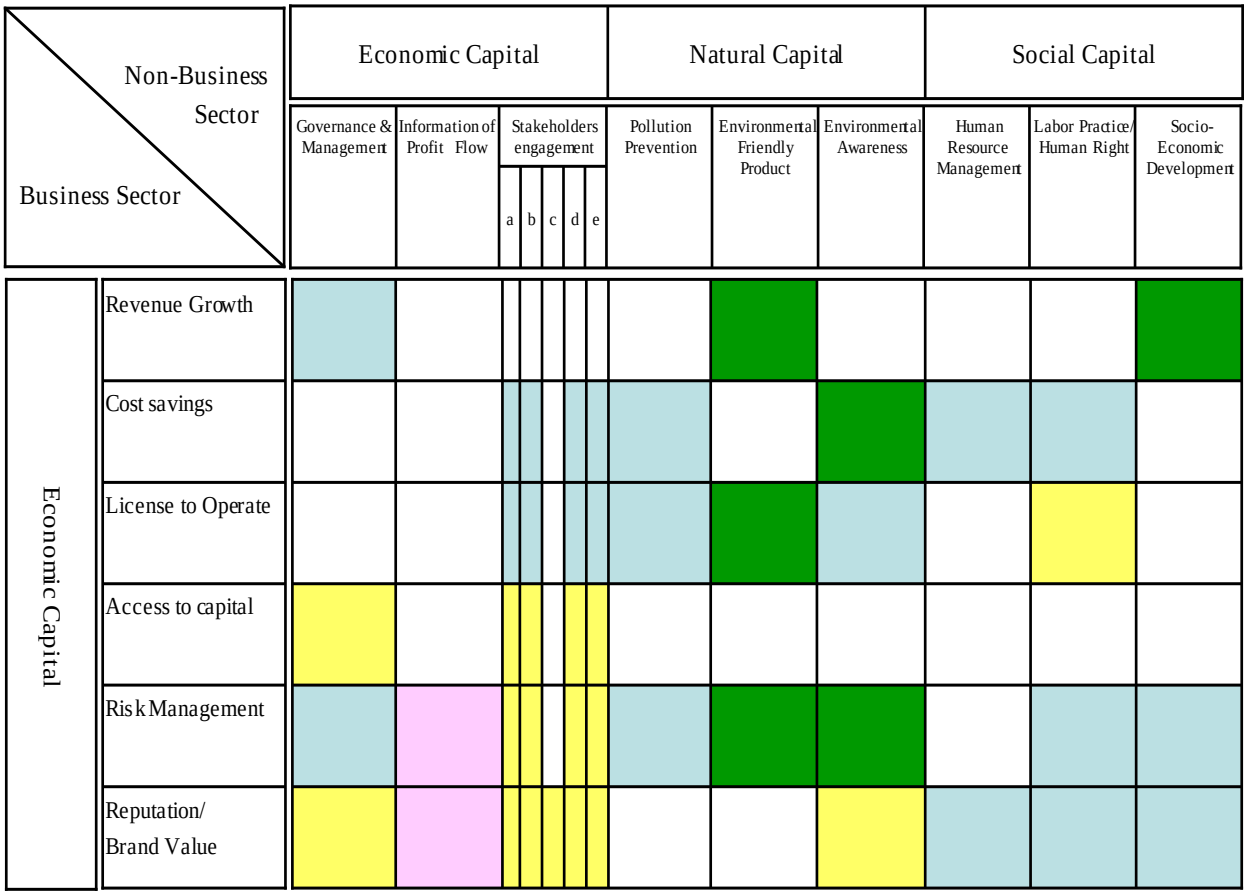
Table 5.7 Sustainability Activities Evaluation Result of Samsung SDI in 2004

Non-Business Factor		Title of Activity	Contribution to Sustainability Frontier Curve (Evaluation Result)
Economic Capital	Governance & Management	· CEO Message: Introduction of high performance in triple bottom lines Perspectives	· Reputation/Brand Value (①)
		· Strategic Framework: Management Philosophy-Management Principles in triple bottom line-(New) Vision	· Reputation/Brand Value(③)
		· Board of Director: 8 Director (4 internal and 4 external); however, one more external director designated in 2005 according to "the Commercial Law and the Securities and Exchange Act"	· Access to Capital, Risk Mgt.(②)
		· Sustainability Management Structure: CEO-Management Administration Office-CRO(Chief Risk Officer, taking care of Social and Environmental Risk) and CFO(Chief Financial Officer, Financial Risk)-Sustainability Management Office and Committee/CCO(Chief Communication Officer) per each plant	· Risk Mgt.(④)
	Principle of Profit Flow	· Employees(Just No of employees including Employee composition and No of Overseas/Sharing Business Results with employees), Suppliers (Amount of purchasing parts and services from the outside), The Government(Tax), Society(Amount of Donations), Shareholders(Cash Dividend)	· Access to Capital, Reputation (①)
	Stakeholders Engagement	· Suppliers: Sustainable supply chain management (Purchase Policy, Supplier selection and evaluation based on sustainability, Cooperation to strengthen supplier competency, Fair and open procurement /"S-Partner System" evaluated by ISO 9000, ISO 14001, and SA 8000)	· Cost Saving, License to Operate, Risk Mgt.(③)
		· Customers: Customer safety and information protection, , Customer's Proactive Response of Customer Requirements and Voice of Customers ,Productivity Improvement	· Risk Mgt., Cost Saving (②)
		· Public: A Clean Company by transparent and ethical management	· Risk Mgt.(①)
		· Communicating with local communities	· Risk Mgt., Reputation (②)
		· Integrated Environmental Management and Environmental Audit/Independent Verification Report	· Access to Capital, Reputation (②)
Nature Capital	Pollution Prevention	· Efficient Resource Utilization	· Cost Saving (②)
		· Water Saving	· Cost Saving (②)
		· Reduction of Carbon Dioxide Emission	· Risk Mgt. (②)
		· Activities to Reduce Pollutant Emission	· Risk Mgt. (②)
		· Hazardous Chemicals Control	· License to Operate (③)

	Environmental Friendly Products	· Eliminating Hazardous Materials from Products (Compliance with RoHS for Parts and Material) based on Analysis of Hazardous Substance in All Products and Materials	· Revenue, License to Operate, Risk Mgt (③)	
		· Improvement of Green Quality of Product on based on Eco-Design (The Best Flat Panel Display, PDP; World Best OLED, Less Resource Usage for DR, Power Saving CRT, Lithium-Ion Battery for Higher Efficiency, etc)	· Revenue, License to Operate, Risk Mgt (④)	
		· Convert Light to Electricity(Solar Cell and Solar Panel), Hydrogen(Fuel Cell)	· Revenue, Risk Mgt. (④)	
		· Working with Part Suppliers	· Risk Mgt. (③)	
	Environmental Awareness	· Sustainable Management Initiative System (SMIS)(a Total Information System): Will be linked existing backbone systems such as ERP, Costing System, e-Energy System, and Project Management System, analyzing product environment and controlling progress of sustainability management	· Cost Saving, Risk Mgt (④)	
		· Green Communication: Eco-System protection program engaging stakeholders, Monitoring the surrounding environment, Internal Compliance, Voluntarily joining government-led environmental programs	· License to Operate, Risk Mgt (③)	
		· Samsung Park by the Malaysia Plant	· Reputation(②)	
Social Capital	Human Resource Management	· Winning Talents, Development of People, Development of Brains and Next-Generation Leaders, Education of Employees, Overseas Expert Development Program, Education for Families of Employees	· Cost Saving, Reputation(③)	
	Labor Practice/ Human Right	· Innovation Activities to Build a Trusted Company-Labor Relationship: Busan Plant, 'Myeon-Mun-Jong-Ga (the Distinguished and Honored Family)' - 'Myeong Jang (Craftsmanship)', 'Myeong-Pum (Prestigious Products)', 'Myeong-Ye (Reputation)'	· Cost Saving, Risk Mgt, Reputation (④)	
		· Quality of Living of Employees including various Voluntary Welfare System	· Reputation (②)	
		· Health and Safety, Anti-Discrimination, forced/Child Labor	· License to Operate, Risk Mgt. (②)	
		· More Opportunities Given to Female Workforce: The First Female Executive in 35 years	· Cost Saving, Reputation (③)	
	Socio-Economic Development	· Contributing to Global Social Development (International School in Manaus, Brazil, Tianjin Plant in China, in the Vanguard of 'Healthy-Eye' Campaign	· Revenue, Reputation (④)	
		· Supplier Support Center	· Risk Mgt., Reputation, (③)	
		· Social contribution: Social Welfare (e.g., From 'Light' to 'Sound' etc.), continuous Matching Grant Fund, Community Partnership of SDI Hungary	· Reputation (③)	

Note: The number in the parentheses means the results which activities of Samsung SDI were evaluated based on the criteria presented in Figure 2.7.

Figure 5.4 Actual Response Analysis of Samsung SDI



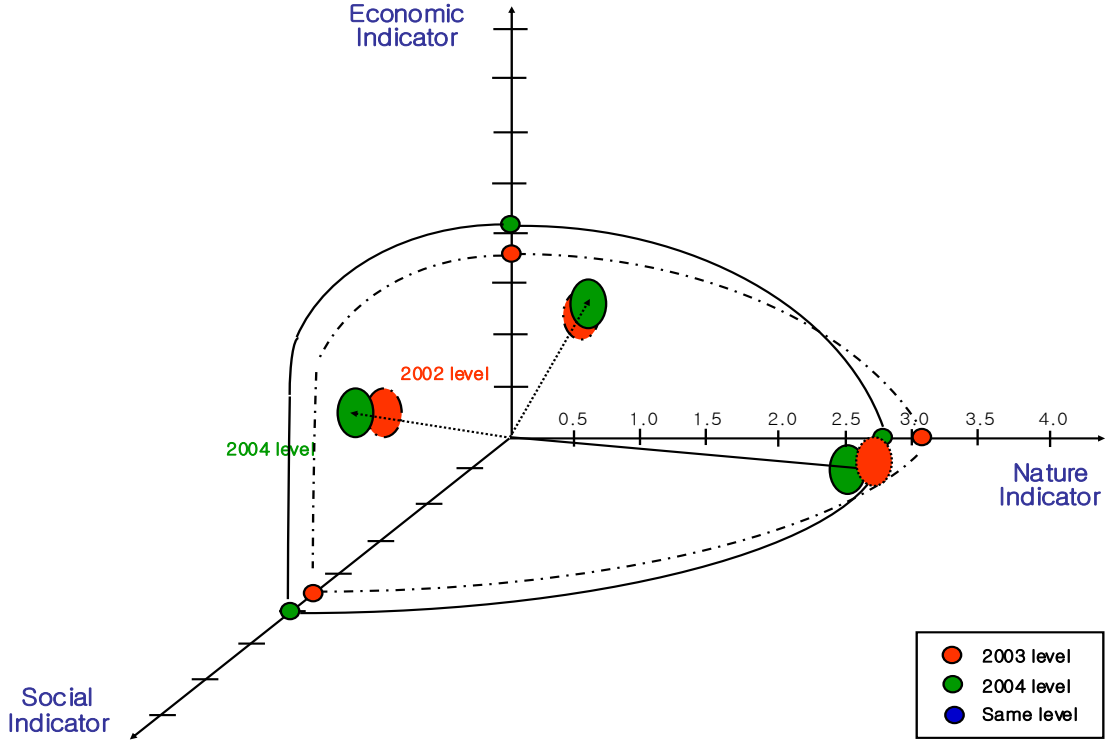
Note: The color reflects the level of sustainable activity based on the criteria (see Figure 2.7).

Figure 5.5 provides the gap analysis between 2002 and 2004 of the sustainability possibility frontier curve[96] (hereafter, SPFC) in a Korean electronics company. The sustainability frontier curve in this dissertation can be regarded as a corporate value by sustainability activities, based on the linkage between business factors (traditional economic capital) and non-business factors (so-called, economic capital, nature capital, and social capital). In the case of a Korean electronics company, the level of SPFC in 2004, on the whole, was more enhanced than that in 2002. However, natural capital decreased on account of better activities in 2002 related to production processes and products, and the difficulty in developing innovative environmental technology, even though environmental issues related to products have been solved. The improvement of economic capital is mainly due to proactive activities related to governance and management, and stakeholder engagement, in spite of a move towards sustainable industry. In the case of governance and management, the strategic framework for sustainability management in 2004 was clearer than that in 2002. The use of ethical management, which is an

[96] A sustainability possibility frontier curve (SPFC) can be described the possible combination of TBL factor that can be attained for a given set of activity. That is to say, it reflects the degree of corporate value in sustainability perspective.

ambiguous concept, therefore is in contradiction with the existing management philosophy, and is basically different from the view regarding the purpose of a firm, which is minimized. Instead, management/business principles were established in order to achieve a management philosophy. Ethical management was applied on the basis of its social responsibility.

Figure 5.5 Gap between 2002 and 2004 of Sustainability Possibility Frontier Curve in Samsung SDI



Note: The direction of the variation is more important than the distance of that. The upward move means the improvement of the level of sustainability management.

All the driving forces in social capital have contributed to moving the SFC upwards. Winning talent, development of next-generation leaders, overseas expert development programs, and education for families of employees in human resource management were once considered as rare activities. A wide range of innovative activities to build a trusted company-labor relationship and the first female executive in 35 years in labor practice were considered as valuable and rare activities, and as contributing to global social developments and supplier support center in socio-economic development. However, 'From Light to Sound" activities for social welfare were considered as a rare activity being low in comparison to the 'Giving brightness to the visually challenged' activity in 2002 which was also considered as valuable and rare activity. 'Sound' is not directly related to business, even though the activity itself is highly meaningful, especially from a sustainability perspective.

2) Automobile Industry

① Characteristics of Automobile Industry

The characteristics of the automobile industry, particularly, considering sustainability, can be described as follows:

- Generally, the basic design plan consists of dividing the product into different parts, allocating the various functions to them, and deciding how to connect them (interface). This is what we call the "architecture." There are two dimensions of the architecture. One dimension comes from the product level, represented by the "modular architecture," a simple type with a comparatively standardized interface, and the "integral architecture," with a more complex relationship of parts and functions that requires each of the parts to be optimally designed to achieve its overall performance. The other dimension deals with the relationship among corporations, consisting of the "open architecture" and the "closed architecture." The open architecture is along the same line of the modular architecture in the sense that the interface is standardized and that the system can be designed by mixing and matching different parts, but in the open architecture, this is carried out beyond the boundaries of a single corporation. On the other hand, in the closed architecture, it is done within a single corporation. In terms of structure, the automobile is a very complex mechanical product. It is made up of a large number of parts. Although, it depends on the way you count, if you disassemble everything to nuts and bolts, you will ultimately end up with about 20,000 to 30,000 individual parts. Even though the use of plastic and aluminum parts has increased in the recent years, the automobile is basically a product made of over a ton of product.
- Since automobiles consist of a wide range of materials and parts, the automobile manufacturer is unable to manage all manufacturing processes on its own. The parts are made by a vast number of parts suppliers, well over 10,000. Currently, the majority of first-tier suppliers are large-scale businesses with over 1000 employees. On the other hand, most of the second-tier suppliers who provide parts to the first-tier suppliers are typically small and medium sized businesses with 50 to 100 employees. Further, the third and fourth-tier suppliers who provide parts to them are very small-scale businesses with only 5 to 10 employees. We also mustn't forget the important role of electronic parts suppliers and material suppliers such as steel and plastics.
- It is an industry that has a huge influence on the national economy. The influence of this industry is far-reaching, and, as a result of its extensive effects, it has been positioned as a strategic industry in many countries. Sometimes, the industry even symbolizes the nation's prestige. Interestingly, this industry is viewed as a kind of "nation-owned capital and technology power." It is based on advanced industry structure.
- The automobile technology has advanced in a comparatively stable manner[97]. In recent years, there

[97] The hybrid Prius technology of Toyota is a kind of dramatic change in the Automobile industry. However, it is not innovative technology. Particularly, it did not achieve as much fuel efficiency improvement as expected. Recently, hybrid plug-in, fuel cell, diesel engine technologies have newly emerged. That is to say, it will make a

have been no great revolutions that brought a drastic change to the existing structure of the industry. The basic principle has been a slow and steady "cumulative progress." The competition in the auto industry is not dramatic, but is nevertheless severe. US, European, and Japanese auto manufacturers run neck and neck to unfold keen competition. At the product level, 20 to 30 auto manufacturers are fiercely competing worldwide. However, at the same time, many manufacturers establish partnerships locally to complement for their weaknesses, in the form of joint development, joint production, or technological tie-ups. In this industry, there is no strong move towards oligopoly by a few auto manufacturers, or the formation of regional blocks through protected trade. Instead, it has been a simultaneous mix of three business modes, which are cooperation, competition, and conflicts such as trade friction. Therefore, strategic alliances with multi-national automobile companies should be demanded for globalization through international specialization and expansion of market share.

Dominant economic characteristics of the industry environment are:

- The market for the automotive industry is global, and is constantly increasing. Developing countries need vehicles, and developed countries will always need new vehicles.
- The number of automobile companies is not growing. This is due to the amount of capital it takes to start an automobile company, and the Industry trend towards partnership.
- An automobile company must keep pace with constantly increasing technology. Failing in this effort, would cause the company to slip behind others in performance.
- The production of something as large as an automobile needs to be done on a large scale, which causes automobile firms to operate a small number of large plants that are centrally located to their markets.
- Because there is a high capital requirement in the automobile industry, most automobile companies are publicly traded.

② Economic and Social Characteristics of the Korean Automobile Industry

Domestic demand for automobiles has decreased since 2002, despite a new model release and sales promotion. This is mainly due to contractions in consumer spending which resulted from a sluggish economy and surging oil prices. However, automobile exports have been increasing steadily, assisted by enhanced quality, improved brands, and better marketing. These valuable efforts were a direct channel to a further expansion to new markets in Central and South America, the Middle East, and Eastern Europe as well as in securing existing major markets like the U.S. and Europe. Robust exports contributed to a surge of 5.9% in automobile production despite extremely weak domestic sales. Overseas market share has been more pronounced since 2000; the percentage reached to almost 70% in 2004 (see Table 5.8 and Figure 5.6).

Table 5.8 Domestic Demand and Supply in Automobile Industry in Korea

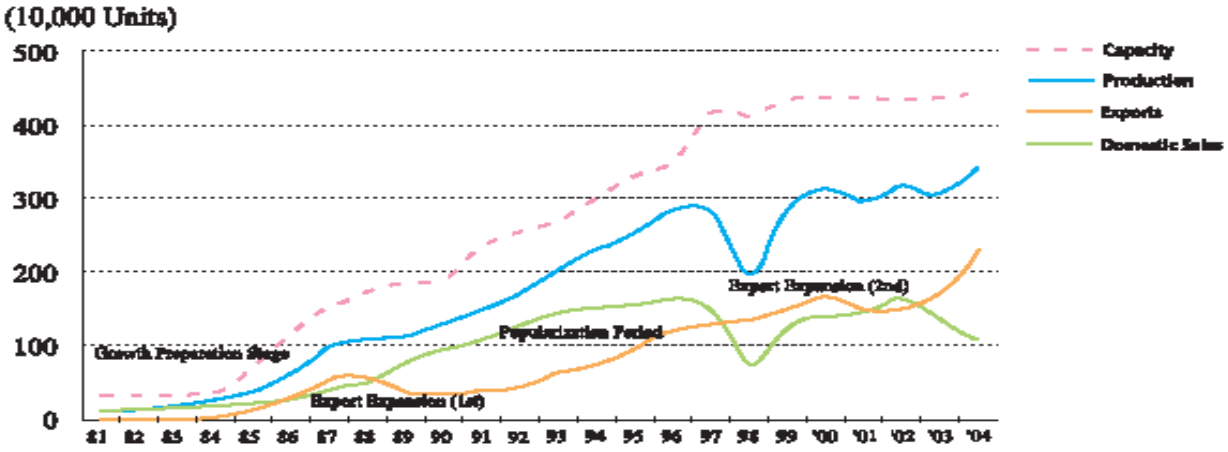
great contribution to improve fuel-efficiency, however it should be considered as a bridge technology between gasoline engine and hydrogen engine, not a innovative technology (Interview with an expert in Korean automobile industry, October, 12, 2006)

(Unit: 1,000)

	1999	2000	2001	2002	2003	2004
Production	2,843.1	3,115.0	2,946.3	3,147.6	3,117.9	3,469.4
Export	1,506.9	1,676.4	1,501.2	1,509.5	1,814.8	2,379.5
Domestic Sale	1,273.0	1,430.4	1,451.4	1,622.2	1,318.3	1,093.6
Import	5.7	11.2	16.6	30.4	30.5	34.7

Source: KAMA

Figure 5.6 Automobile Production Trend, Domestic Sales, and Exports from Korea



Source: KAMA

There are five car makers in Korea: Hyundai, Kia, GM-Daewoo, Renault Samsung, and Sangyong Motor. However, the shares of Hyundai and KIA Motor in production are highest in Korea at 48.2% and 29.4% respectively in 2004. Domestic carmakers have striven to expand their overseas sales and local production abroad. Recently, Hyundai Motor started production at its Alabama plant in the United States, expanded production capacities at its local plants in China, India and Turkey, and is preparing to equip itself with a global 5 million unit/year production system by 2010. GM Daewoo is expanding local knockdown (KD) production abroad and KIA Motors is constructing a plant in Slovakia, while increasing production capacity at its local plant in China. Meanwhile, foreign carmakers' investments in Korea have increased as well. In February 2004, India's Tata Motors acquired Daewoo Commercial Vehicle and early this year, China's SAIC acquired Sangyong Motor. Renault Samsung and GM Daewoo also plan to expand investments in Korea, including construction of engine making plants and test tracks.

In summary, the auto industry landscape is characterized by a deep slowdown in domestic demand that was more than offset by soaring exports, expanding global management and increasing investment by Korean automakers overseas as well as by foreign carmakers in Korea.

Based on a 14% annual growth of the industry over the past 20 years, it now accounts for 11% of the nation's total manufacturing production and 10% of its total employment. There is no doubt that the

automobile industry, a symbol of the nation's industrial muscle, has developed into a core strategic industry for Korea. In spite of the industry contributions, corporate governance, environmental pollutants emitted by cars, and labor practices (mainly, human resource management), Korean car makers have been recently criticized by a wide range of stakeholders with the emergence of their sustainable development issues.

③ Environmental Characteristics of Korean Automobile Industry

Recently, the Korean government began pursuing policies to create a more pleasant living environment for citizens in Korea. Part of this effort is directed at the automobile industry, since the increase in the number of registered vehicles has turned air pollution caused by car emissions into a serious problem. Therefore, it continues to strengthen criteria related to automobile exhaust gases and fuel quality. It is a situation universal to most countries. In the U.S and the EU, for example, which are the main export areas, they have already strengthened their permissible criteria for emissions and for fuel quality manufacturing. U.S Low Emission Vehicle (LEV) standards have already been applied to gasoline cars since 2003 and EURO Ⅳ standards will be applied to diesel cars in 2005 and 2006. Hazardous gases emitted by cars have a bad impact not only on human health, but they also are currently presented as main causes of global warming, ozone depletion, acid rain, photochemical smog, etc. The following are hazardous gases emitted by type of car:

- Gasoline Car: CO, HC, NO_x
- Diesel Car: CO, HC, NO_x, PM(Particulate matter), Smoke (in case of Diesel car, NO_x and PM emitted too much are very serious)
- Others: CO_2, O_3, SO_x, VOC, Freon, N_2O, CH_4 etc.

Automobile makers also use much energy, and accordingly, emit hazardous gases in the air, and produce solid wastes from car-making. Table 5.7 shows pollutants produced in the process.

Table 5.9 Environmental Pollutants by process of Automobile Industry in Korea

Process		Main Pollutants
Casting and Forging		・Dust, SO_2, NO_2, CO, Waste Casting materials, dissolved dust, solid incinerated materials, etc
Mechanical Process & Press		・Steel Sheet Residues, Metal Chip, Waste Cutting Oil, Waste Oil
Body Line		・CO_2, MIG(Metal Inert Gas Are Welding) Fume gas, etc
Coating & Painting	Pre-process	・PO_4, NO_2, Ti, Ni, Distillate, Surfactant, Waste Water
	Post-process	・Waste Water etc
	Upsetting	・Toluene, Xylene, Styrene, Waste Water, etc
	Painting	・Toluene, Xylene, Styrene, Waste Water, etc
Dresser Line		・Oil, Metal, Paper, Wood
Final Line		・Fuel, Refrigerant

Source: Interview and MOCIE

④ Technology trends in the Korean Automobile Industry

Recent technology developments in the Korean automobile industry have mainly focused on coping with safety and environmental challenges. Car safety is the most basic principle in the automobile industry. Together with safety, environmental challenges have recently been more and more crucial factors for car makers' sustainable competitive advantage. Generally speaking, industry experts think that its importance will be greater in the future, particularly in the automobile industry. Thus, Korean car makers have already prepared environmental friendly technologies to achieve sustainable competitive advantage based on coping with the requirements of a wide range of customers, mainly manufacturing process technologies, low emission vehicle technologies, and recycling of wastes:

- Manufacturing Process technology: Korean car makers have strived to develop energy-efficient processing technology including systems for measuring amounts of energy used by each process stage. Besides these technologies, they have also taken efforts to reduce resource materials, waste minimization in the process, and alternatives of hazardous material.
- Low Emission Vehicle Technology: The rapid emergence of climate change in 1990s has moved car makers in the world towards technology development regarding low emission vehicles. Korean car makers also established three objectives such as energy saving, reduction of their dependence on petroleum, and pollution-free vehicles to help them with their sustainable competitive advantage. The main technologies include:
  - Small size 3L car (fuel-efficiency: 33.4km/*l*) development
  - Postprocessor equipment: Leanburn catalyst, $DeNO_x$ catalyst, Diesel Smoke filter, etc
  - Engine using alternative fuel: Engine development using Natural Gas, LPG, DME, etc cleaner fuel, and synthetic fuel
  - New combustion engine: HCCI etc
  - Electronic Control Valve: Optimal fuel-efficiency according to driving conditions;
  - Hybrid car : Based on combination of gasoline engine power and electric motor power, improvement of fuel efficiency, particularly, low speed drive in the city;
  - Fuel Cell Car: Aiming at zero emission car
  - Light weight of body: Light weight of car based on usage of aluminum in the engine block, resin in aspirator and ventilator, stainless, etc
  - CVT: Speed change of automatic transmitter can be controlled without any stop, and it will contribute to enhance fuel-efficiency.
- Environmental Friendly Recycling Technology of Waste Vehicle: Waste cars are highly valuable sources of raw materials, particularly in the steel industry. Recycling technology is very important for sustainable development. After 2015 EU will require recycling rates of waste cars beyond 95%.

⑤ External Sustainability Analysis of Automobile Industry

Table 5.10 and 5.11 provide the results of external sustainability analysis for the Korean automobile industry and they are displayed in Figure 5.7 as a type of CVMS to identify easily the linkage between the traditional business factors and factors for CSM.

Table 5.10 Opportunities Analysis of Automobile Industry in Korea

Non-Business Factor		Title of Factor	Influence on CSM Driving Forces (Evaluation Result)
Economic Capital	Governance & Management	· Relatively, being improved awareness of international society regarding corporate governance of Korean companies	· Access to Capital, Reputation
	Information of Profit Flow	· Increased Demand for Profit or Benefit Sharing with the Companies	· Access to Capital
	Stakeholders Engagement	· Flourish of Global Economy · Gradual-recovering of domestic market · Gradual Improvement of rationale of stakeholders including shareholders · Better Competency of Korean Electronics Companies · Proactive fostering industry policy by Korean Government · Inroad to the domestic of global car makers · Rapid Enhancement of Korean Car Quality Awareness in Foreign Market · Geographical Nearness to Asia Countries including China, the most potential market in near future · Transparency of non-financial performance including financial performance and, recently, concerns on evaluation of corporate activities in sustainability perspectives (Several Guidelines on environmental and sustainability Reporting)	· Revenue · Revenue · Risk Mgt. · Risk Mgt. · License to Operate · Cost Saving, Reputation · Revenue · Revenue · Access to Capital, Reputation
Nature Capital	Pollution Prevention	· Prompt Responsiveness of Korean Government according to business atmosphere for encouraging Korean industry in Cleaner Production sides · International and Domestic economic incentive tools like deposit, emission trading, etc.	· License to Operate · Cost Saving
	Environmental Friendly Products	· Increased Demand for environmental friendly Products	· Revenue, Reputation
	Environmental Awareness	· A wide range of education and training programs regarding environmental awareness · Being Increased Suppliers' Importance for coping with a wide range of regulations	· Cost Saving · Risk Mgt.
Social Capital	Human Resource Management	· Relatively, Better Quality of Human Resources in Korea	· Cost Saving, Risk Mgt.
	Labor Practice/ Human Right	· Cooperation with labor union through long experiences in this field · Enough Experience with management system approaches through ISO 9000 series, ISO 14001, and OHSAS 18001, etc · Integrating standards of social responsibility of ISO 26000 series in 2008 in management system perspectives	· Cost Saving, Risk Mgt. · Cost Saving , Risk Mgt., Reputation · Cost Savings
	Socio-Economic Development		·

Note: The number in the parenthesis reflects the impact on the financial performance.

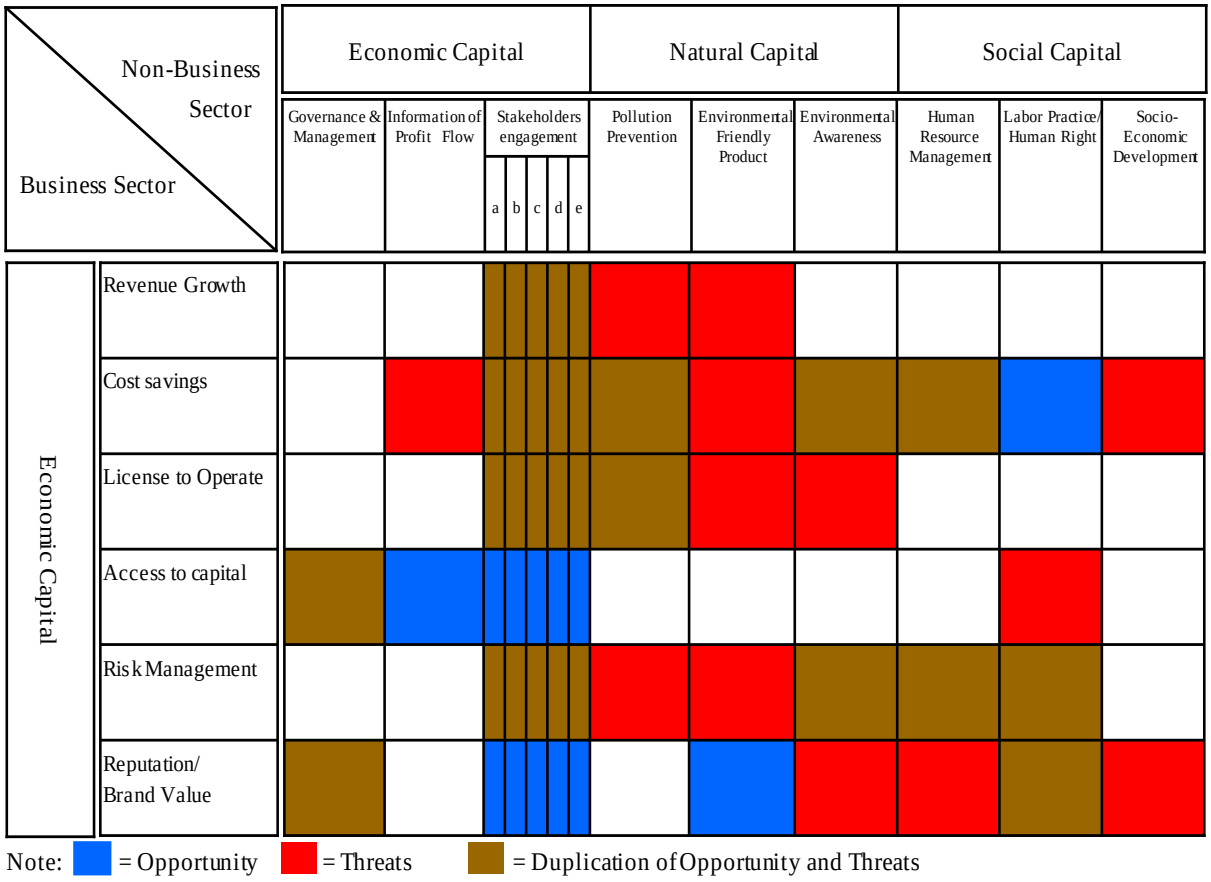
Table 5.11 Threats Analysis of Automobile Industry in Korea

Non-Business Factor		Title of Factor	Influence on CSM Driving Forces (Evaluation Result)
Economic Capital	Governance & Management	· Increased demands for transparency and Objectiveness of management in accordance with a wide range of international and domestic standards, Sarbanes-Oxely law, business ethics, etc	· Access to Capital, Reputation
	Information of Profit Flow	· Increased Demand for Profit or Benefit Sharing with the Companies	· Cost Saving
	Stakeholders Engagement	· World-wide Competitiveness Deepening	· Revenue, Cost Saving
		· Regionalism and Block of EU, North America, etc	· Revenue, Risk Mgt.
		· A fast-growing Least Developed among Developing Countries (LDDC) like China, India, Thailand, etc	· Revenue, Cost Saving
		· Acceleration of deindustrialization	· Risk Mgt
		· More wide range of stakeholders and frequently, their unreasonable arguments regarding sustainability arguments	· License to Operate, Risk Mgt.
		· Concerns on Expansion of gap with advanced car makers in high-technology	· Cost Saving, Risk Mgt.
		· Inroad of foreign car makers into domestic market	· Revenue, Risk Mgt.
		· Being pure assembler plant as One of Assembling Lines of Global Car maker	· Risk Mgt
		· Relatively weak competitiveness of Korean Car Parts Companies	· Cost Saving, Risk Mgt.
		· Transparency of non-financial performance including financial performance and, recently, concerns on evaluation of corporate activities in sustainability perspectives (Several Guidelines on environmental and sustainability Reporting)	· Cost Saving
Nature Capital	Pollution Prevention	· International and Domestics regulations including conventions (e.g. Montreal Protocol, Kyoto Protocol, Stockholm Convention, etc) focused on products and substances based on IPP, especially RoHS, WEEE, REACH, ELV, etc	· Revenue, Cost Saving, License to Operate
		· International and Domestic economic incentive tools like deposit, emission trading, etc.	· Cost saving
		· Relatively Weak Environmental Management of External Contractual Companies	· License to Operate, Risk Mgt.
	Environmental Friendly Products	· Fuel Efficiency and Environmental law including exhaust gas, Particularly in EU (e.g, EURO Ⅱ, Ⅲ, Ⅳ & CO_2 Reduction Convention, Recycling Regulation; Directive 2000/53/EC, Regulation of Hazardous Substances, etc)	· Revenue, License to Capital, Risk Mgt.
	Environmental Awareness	· Expansion of Ethics or Normative perspectives	· Cost Saving, License to Operate, Reputation
		· Lower awareness regarding necessity of Environmental Management	· Risk Mgt.
		· Awareness of Suppliers' Importance for coping with a wide range of regulations	· Cost Saving

Social Capital	Human Resource Management	· Increased Requirements for Corporate Social Responsibility including Various Guidelines such as Global Compact, MNCs Principle, International Standards	· Cost Saving, Risk Mgt., Reputation
	Labor Practice/ Human Right	· Increased Demand for participation in Management · Increased requirements for corporate social responsibility including various Guidelines such as Global Compact, MNCs Principle, International Standards · International standards like SA 8000, ISO 26000, etc.	· Access to Capital · Risk Mgt., Reputation · Cost Saving, Reputation
	Socio-Economic Development	· Proactive Social Activities of MNCs in advanced global companies, especially in EU · Approach based on ethics or normative perspectives regarding the purpose of a firm	· Cost Saving, Reputation · Cost saving, Reputation

Note: The number in the parenthesis reflects the impact on the financial performance.

Figure 5.7 External Sustainability Analysis of Korean Automobile Industry



Driving forces of economic capital such as governance/management, information of profit flow and stakeholder engagement, which are highly related to all business factors from both opportunity and threat perspective, may mainly impact capital and reputation/brand value, and give a similar appearance with that of the Korean electronics industry. The Korean automobile industry has a long trade union tradition, therefore, an improper information of profit flow can also have a negative impact on cost

saving/productivity. In accordance with a wide range of intensified environmental regulations, focused mainly on fuel efficiency, hazardous substances, and emission pollutants, three driving forces of natural capital have been carried out to impact practically on revenue growth/market share, cost saving and licenses to operate in business factors based on risk management. Particularly, the automobile industry is a kind of 'architecture' which consists of more than 20,000 parts directly or indirectly related to parts suppliers of over 10,000. Therefore, the 'access to operate' and the 'risk management' are crucial factors and they are highly related to cost savings and revenue in finance capital for the automobile industry. Fuel efficiency and environmental laws including exhaust gas and hazardous waste can have a decisive impact on cost saving and revenue. Three driving forces of social capital have a similar appearance with that of the Korean electronics industry. In a different way than the Korean electronics industry, it has a long experience with dialogue and cooperation with labor unions. Therefore, its social responsibility activities can play a positive role in business sectors like cost saving. However, improper responses could lead to a severe negative impact on business factors such as cost saving and access to capital.

⑥ Actual Responses Analysis of Hyundai Motor

Table 5.12 and 5.13 present the evaluation results of the test Hyundai Motor according to sustainability perspectives. The former shows the results of 2002 activities and the latter shows the results of 2004 activities. Figure 5.8 provides the impacts of each activity implemented by the Korean automobile company (Hyundai Motor) on business factors in accordance with the criteria (See figure 2.7). Its calculation procedure is the same as that of Samsung SDI (See 5.3.1, p. 17).

The CEO's awareness of the Korean core automobile company regarding sustainability has been changed from a tool for its reputation/brand value to a management philosophy and a way to grow continuously. The CEO of the Korean core automobile company argued that "sustainability is a matter of immediate implementation (no longer a matter of planning and creating fancy slogans), therefore, restructuring its business management system" in his message of 2004. In spite of his speech, most of its activities in economic capital have focused mainly on the indirect improvement of factors in the business sector such as access to capital, risk management, and reputation/brand value than on direct improvement factors in economic capital such as cost saving/productivity and revenue growth. According to the importance of external sustainability factors on the Korean automobile industry (see figure 5.7), its responses, should be more proactive and should more directly improve the performance of its business factors than its activities carried out from 2002 to 2004. On the whole, most of activities related to stakeholder engagement have not been strong enough to impact directly on cost saving/productivity and revenue growth. Furthermore, information and principles regarding its profit flow have been ambiguous. This Korean automobile company, which has proactively strived to go to overseas markets, should open the principle or direction regarding information of profit flow to stakeholders. All the activities for the improvement of economic capital in non-business circles should

be intensified, preferably in order to achieve sustainable advantage competitiveness in the world.

Its responses regarding natural capital have seemed to be by and large implemented in accordance with the external sustainability factors of the Korean automobile industry. They have mainly focused on licensing to operate and risk management and some activities related to process prevention and environmental friendly products have been directly aimed to improve cost saving and revenue growth. However, in order to get sustainable competitive advantage and continuous growth in the global market, its activities should be intensified, if possible, to directly impact business factors such as cost saving and revenue growth. Particularly, activities related to environmental awareness should be preferably improved for taking account of external sustainability factors of the Korean automobile industry.

Its responses regarding social capital have been carried out in order to mainly improve the reputation/brand value, even though some activities in human resource management have been implemented in order to directly improve cost saving such as higher learning for the talented, an education management introduction system, training and education in overseas plants, cultural education for family involvement, and a cyber housewives' college according to the human resource program and its education policy. Its activities for socio-economic development such as a 24-hour emergency vehicle rescue team, children traffic safety campaign, voluntary recalls, free checks for disabled people and people living in island areas, are valuable and rare. These will be helpful to achieve sustainable competitive advantage in the market.

Taken by and large, continuous R&D activities of a Korean automobile company including hybrid and fuel cell cars are right in order properly respond to the external sustainability atmosphere such as rigorous domestic and overseas standards regarding fuel efficiency, pollutants emission, hazardous substances, etc. The verification and assurance activities conducted by internationally trusted third parties are also appropriate and good as a global leading car maker from a transparency perspective. However, considering the environmental characteristics of a car which consumes fossil fuels and emits pollutants on a large scale, environmental awareness activities of natural capital and social economy development activities of social capital must be intensified and linked. Recently, a wide range of social economic development activities such as voluntary recall, 24-hour emergency vehicle rescue, Children Traffic Safety Campaign, Free Check for Disable People, Islands area, and Donation of Ambulances to Africa, were carried out. However, those activities did not consider the importance of energy and environmental issues, which are the chief priorities in the sustainability of a Korean automobile industry according to external sustainability analyses. Additionally, R&D activities for improvement of energy and environmental issues should be focused on cost saving to achieve sustainable competitive advantage. At the same time, its stakeholder analysis carried out in 2003 for enhancing economic capital must be conducted regularly to identify its stakeholders and their needs. The framework of strategic sustainability management has also been much more systematic compared with that performed in 2002. However, its ethical management was not given a proper position in its strategic sustainability framework. Because of that, its management philosophy and its purpose are a little ambiguous.

Table 5.12 Sustainability Activities Evaluation Result of Hyundai Motor in 2002

Non-Business Factor		Title of Activity	Contribution to Sustainability Frontier Curve (Evaluation Result)
Economic Capital	Governance & Management	· CEO Message: Human value and contributing to society through the preservation of the environment; enhance quality of life through supplying safer, environmental-friendlier vehicles and increase the number of channels for proactive communications	· Reputation (②)
		· Strategic Framework: Management Philosophy framework in sustainability perspectives, however Careful of terminology like Corporate Social Responsibility and Corporate Citizenship, ethic charter etc	· Reputation (①)
		· Board of Directors: Total 8 Directors (internal 4 and external 4) ; however, introduction of corporate-level environmental committee	· Access to Capital, Risk Mgt.(②)
		· Ethic Charter as Business Principle: Ambiguous Role in Strategic Framework	· Risk Value, Reputation(①)
		· Launch of Corporate-level Environmental Management Organization; Establish green marketing, Sales, Service system	· Risk Mgt. (③)
		· Introduction of Sustainable Activities according to Value Chain	· Cost Saving, Risk Mgt. (③)
	Information of Profit Flow	· No Comments	· Access to Capital, Reputation (0)
	Stakeholders Engagement	· Environmental Management IR	· Access to Capital (②)
		· Set up Cooperation System with Stakeholder on the environment; e.g. Tripartite Cooperation Model among Government-Enterprise-NGOs	· License to Operate, Risk Mgt.(③)
		· Cooperate with the government in developing environmental laws & policies	· License to Operate, Risk Mgt., (②)
		· ISO 9000 and ISO 14001 Audit including Environmental Information Disclosure, and Verification by Third Party	· Access to Capital, Reputation (②)
Nature Capital	Pollution Prevention	· Reducing pollutants and to preserving resources and energy at all stages of our products life cycle, from development to production, sales, uses, and disposal; Develop cleaner production technology for low pollution, low cost and high efficiency (pp, 51, 54), Reduce, recycle and reuse waste (p. 52), establish overall material management system(p. 52), introduction green logistics management system (p.54)	· Cost Saving, Risk Mgt. (③)
	Environmental Friendly Products	· Development and distribution of envt'ally-friendly products; Develop and produce next generation vehicle (pp.36~37), Achieved improved fuel efficiency target (pp.39~40), Reduce exhaust emission (pp. 40~ 41), Increase recycling rate and established DfE System (pp. 41~44)	· Revenue, License to Operate, Risk Mgt. (③)
	Environmental Awareness	· Enhance awareness among employees about environment production	· License to Operate, Risk Mgt. (②)
		· Support suppliers in their envt'al mgt.	· Risk Mgt. (②)
Social Capital	Human Resource Management	· HR Policy-Education System-Process :3-Step Education Development: Assessment, Implementation, Evaluation Phase)	· Cost Saving (②)

	Labor Practice/ Human Right	· Labor Relation: Dialogues with Employee and Event for Employee · Various Welfare Programs	· Risk Mgt. (②) · Reputation (②)	
	Socio-Economic Development	· Activities of Social Contribution Committee such as: Auto Industry, Social Welfare, Culture, Community, Volunteer Programs, Education/ Research, Nation Developments, Sports, Environments/Safety · Dismantling Manual for Recycling · Children Traffic Safety Campaign · Global 900, Environmental Friendly Bus	· Reputation (②) · Reputation (④) · Reputation (③) · Reputation (③)	

Note: The number in the parentheses means the results which activities of Hyundai Motor were evaluated based on the criteria presented in Figure 2.7

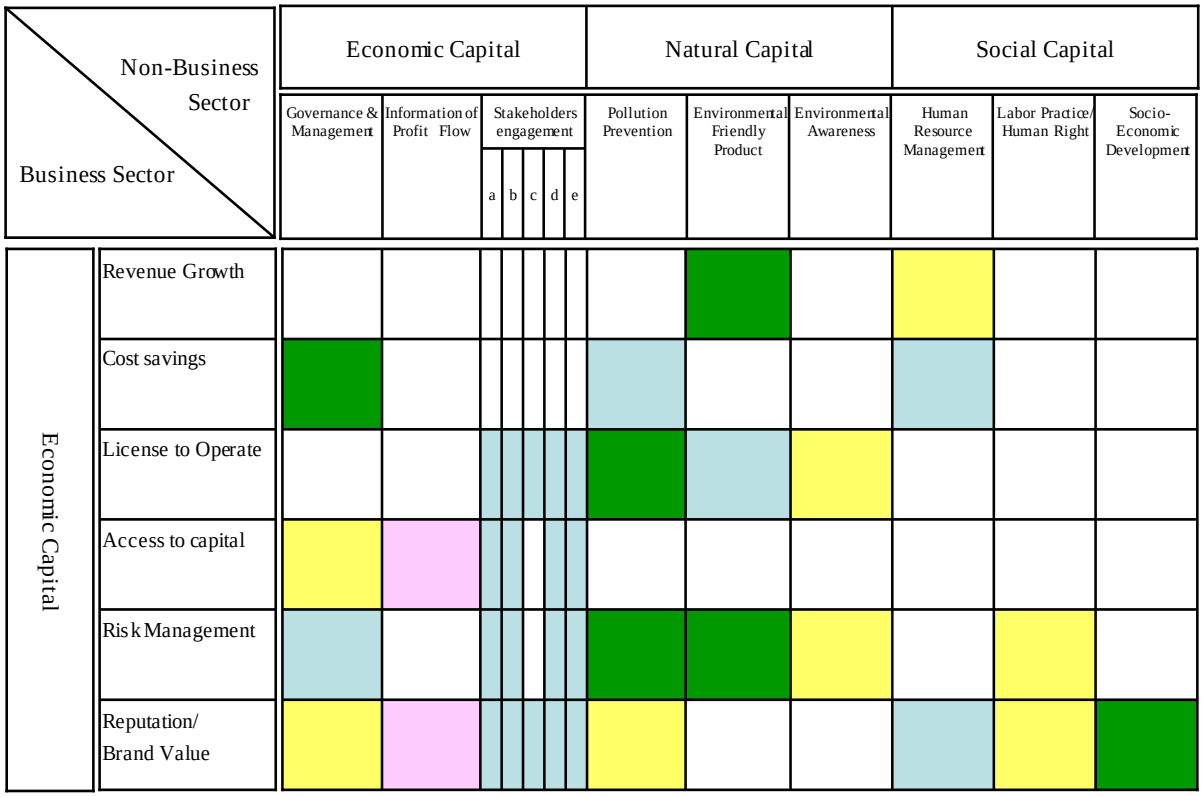
Table 5.13 Sustainability Activities Evaluation Result of Hyundai Motor in 2004

Non-Business Factor		Title of Activity	Contribution to Sustainability Frontier Curve (Evaluation Result)	
Economic Capital	Governance & Management	· CEO Messages: Sustainability is a matter of immediate implementation (no longer a matter of planning and creating fancy slogans), therefore restructuring its business mgt system, Making social contribution, improving ethics mgt, and communicating with its stakeholder · Strategic Framework: Vision-Goal-Policy-Strategy; Its Sustainability Model (Society in Harmony, Ethical and transparent management, Protection of the Natural environment) · Board of Director: Total Director 8 (4 internal and 4 external) · Corporate-level Strategic Environmental Management and Envt'al Committee	· Cost Saving, Risk Mgt., Reputation (③) · Risk Mgt., Reputation (③) · Access to Capital, Risk Mgt. (②) · Risk Mgt. (③)	
	Information of Profit Flow	· Customers (Net Sales and Geographic breakdown of Markets), Employees (Total payroll and benefits)	· Access to Capital, Reputation (①)	
	Stakeholders Engagement	· Sustainable Communication Strategy (selection and communication channel set-up): Customer (Customer Satisfaction, Voice of Customer, Green Service, Sports Marketing, Gets Speed Festival, Invitation Summer Camp, etc)/ Shareholder and investor/ Suppliers (SCEM)/ Dealership (Global Dealer Festival, Global Mechanic Competition, etc), Media · ISO 14001 internal (additional 21 including overseas sites)and external audit (additional Ansan Plant) and Verification and Limited Assurance of Sustainability Report (Scope: Ulsan, Jeonju and Ansan (Korea), Chennai (India), Izmit (Turkey))	· Access to Capital, Risk Mgt. (③) · Access to Capital, Reputation (③)	
Nature Capital	Pollution Prevention	· Developing low pollution, cost effective and highly efficient cleaner production (Water-base Painting facility) /p. 62 · Waste reduction and promoting Recycling/reuse/P. 62	· Cost Saving, License to Operate, Risk Mgt (③) · Cost Saving, Reputation (②)	
	Environmental Friendly Products	· Continuous Effort for Development and distribution of environmentally-friendly products (pp. 37~53)	· Revenue, License to Operate, Risk Mgt. (③)	

	Environmental Awareness	· Environmental safety and health training: Routine, New Employee, Transferred Employee Training (p. 110)	· License to Operate, Risk Mgt. (②)	
Social Capital	Human Resource Management	According to Human Resource Program and its Education policy · Higher Learning for the talented · Education Mgt Introduction System · Training and education in overseas plants · Cultural education for family Involvement · Cyber Housewives' College · Program for employees' children	· Cost Saving, Reputation (③)	
	Labor Practice/ Human Right	· Health and Safety, Human Right, Employee diversity and equality, Security mgt practice mentioned (pp.109, 111~115)	· Risk Mgt. (②)	
	Socio-Economic Development	· Social Partnership: According to "Social Partnership-Interlink-Marketing," actively helping underprivileged children and the elderly and low-income family. · 24-hour emergency vehicle rescue team · Employee and their family volunteer team · Diplomatic Cooperation · Children Traffic Safety Campaign · Voluntary Recall · Free Check for Disable People of Islands a · Donation of Ambulance to Africa · Waste Catalyst Refining Company	· Reputation (③) · Reputation (④) · Reputation (②) · Reputation (①) · Reputation (④) · Reputation (④) · Reputation (④) · Reputation (③) · Reputation (③)	

Note: The number in the parentheses means the results which activities of Hyundai Motor were evaluated based on the criteria presented in Figure 2.7

Figure 5.8 Actual Response Analysis of Hyundai Motor

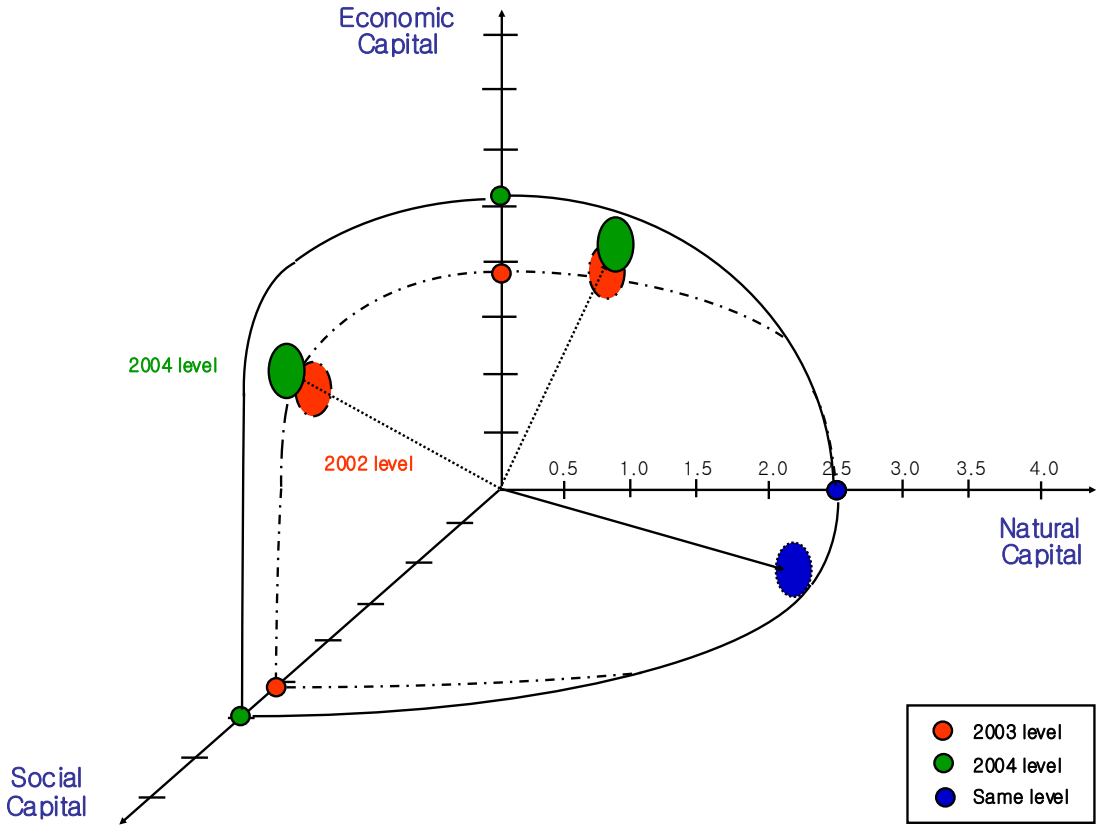


Note: The color reflects the level of sustainable activity based on the criteria (see Figure 2.7).

Figure 5.9 depicts the gap between 2002 and 2004 in the sustainability Possibility frontier curve in a

Korean automobile company (Hyundai Motor). In the case of a Korean automobile company (Hyundai Motor), SPFC in 2004 was, on the whole, moved upward compared with that in 2002. It means that the level of sustainability was more enhanced than that in 2002. However, because innovative environmental technology related to production process and products are not easy to be developed, even though development of environmental friendly products has been continued proactively, the level of natural capital in 2004 did not change compared with the level in 2002. The improvement of economic capital is mainly due to proactive activities related to governance and management like improvement of the framework of strategic sustainability management, and stakeholder engagement such as the establishment of stakeholder communication channels, and third party verification and assurance over its sustainability activities. However, the use of ethical management, which is admittedly an ambiguous concept, should be properly positioned as a business principle (See the p.23). Its improvement of social capital may be accomplished by a wide range of proactive activities related to human resource management.

Figure 5.9 Gap between 2002 and 2004 of Sustainability Possibility Frontier Curve in Hyundai Motor



Note: The direction of the variation is more important than the distance of that. The upward move means the improvement of the level of sustainability management.

3) Korean Steel Industry

① Characteristics of Steel Industry

The special features of the steel industry, particularly, considering sustainability, are classified into five types:

First, the steel industry is based on enormous natural resources such as iron ore, coal, and limestone. Therefore, stable physical distribution must be established. Transportation and distribution costs from mines to consumers of raw materials and products reached almost 10% of turnover. The supply and price of raw material fluctuated according to international situations. In addition, recently, the emergence of environmental and social issues raised the cost burden heavily. Therefore, the location condition and stable supply network considering environmental and social factors are crucial factors that impact price competitiveness and, ultimately, sustainable competitive advantage.

Second, the steel industry, as a supplier of material for other industries has impacted the financial performance of upstream and downstream industries. To conclude, it is the basic industry for country competitiveness.

Third, economies of scale in the steel industry are very important for sustainable competitive advantage. According to production capacities, namely as the production capacity is increased, the production cost has a tendency to sharply decrease.

Fourth, it is an energy-intensive and environmentally-burdensome industry. The steel industry processes which can be further classified into an integrated steel mill based on blast oxygen furnace and an electric steel mill based on an electric furnace generally use huge amounts of fossil fuels such as coal and electric power energy, emit air and water pollutants; and discharge solid and liquefied wastes.

Fifth, it is an equipment intensive industry. It not only has huge facilities and equipment for production, but it also requires a large economy of scale for achieving competitive advantage. Environmental regulations and social responsibilities in the world have been more and more crucial factors in strategic management. The efficiency and eco-efficiency of existing equipment and facilities must be continuously improved, and new cleaner production must be developed and replaced to maintain sustainable competitive advantage.

② Economic and Social Characteristics of the Korean Steel Industry

Despite the high oil prices and raw materials costs and anticipated soft-landing economy of China, Korea’s exports continued to maintain its favorable conditions. Favorable exports boosted the Korean economy up to 4.6% growth in the third quarter of 2004, but the economy is still sluggish, overall. Although the domestic economy turned downward in 2004 as domestic consumption and investment declined, the steel industry continued to grow due to the high overseas demand in the steel consuming industries. However, the imbalance between upstream and downstream, together with high international

steel prices, caused more difficulties in supplying raw materials to the domestic steel industry. During 2004, the demand for long products continued to fluctuate due to the government's policy of stabilizing the overheated construction market. Considering the decreasing trend of residential construction and construction orders received, the consumption of long products is forecasted to decrease 4.3% from 2003. On the consumption of flat products, it is expected to increase 8.2% from 2003, since exports offset the decreasing domestic demand. Consequently, the consumption of aggregate finished steel products will stay at a 1.9% increase in 2004. In 2004, exports and imports displayed 6.7% and 16.7% increases respectively, due to a favorable steel consuming industry and a much improved world economy.

Table 5.14 Domestic Demand and Supply in Steel in Korea

(Unit: 1,000ton, %)

	1999	2000	2001	2002	2003	2004
Aggregate Demand	47,442	52,158	52,307	56,575	59,516 (5.2)	61,308 (3.0)
Apparent Consumption	33,761	38,468	38,272	48,720	45,365 (3.8)	46,214 (1.9)
Export	13,681	13,690	14,035	12,855	14,151 (10.1)	15,094 (6.7)
Production	44,936	48,865	49,072	51,676	53,264 (3.1)	54.011 (1.4)
Import	8,851	11,423	10,737	4,899	6,252 (27.6)	7,297 (16.7)

Note: The statistics in the parenthesis is the increased rate compared with the previous year.
Source: POSRI (each year), *Korea Economy and Steel Outlook*.

According to a clear sign of business boom in the world, steel production and its capacity have increased sharply, and subsequently brought about concerns of oversupply. In particular, BRICs' (Brazil, Russia, India and China) increase in production and demand has made progress rapidly.

Table 5.15 Crude Steel Production and Demand in the world

(Unit: Mil. Ton)

		2001	2002	2003	2004	2005
Domestic Production		43.9	45.4	46.3	47.5	35.3[a]
World	Production	850.0	902.0	965.0	1,050.0	1,125.0(F)
	Demand	770.0	825.0	893.0	967	1026(F)

Note: [a] it is the total of 1~9 month.
Source: KOSA and WSD (2005.1)

Together with the rapid growth of steel production and demand in the world, the international price of raw materials has soared and caused more difficulties in supplying steel scrap to the domestic steel industry. In order to cope with this kind of price fluctuation, large steel makers have pursued a strategy of merge and acquisition (M&A) (see Table 5.16) for becoming bigger. Most raw materials such as iron

ore (mainly; Australia), steel scrap (mainly, Japan, USA, Russia) depend on imports from foreign countries. Korean steel makers have also prepared for countermeasures like consolidation of networks with suppliers, development and procurement of mines and overseas expansion.

Table 5.16 Summary of M&A of Steel makers

	Mittal-Arcelor		CORUS	TKS	JFE
	Mittal	Arcelor			
M&A	Ispat Int'l + LNM Holdings + ISG	Usinor + Arbed + Arceralia	BSP + Hoogovens	Thyssen + Krupp+Dofasco	NKK+Kawasaki

Note: NSC, Smimoto and Kobe steel made a strategic alliance in 2006

One reason for the high price of raw materials is that a bigger oligopoly of raw materials companies has been discussed (see Table 5.17)

Table 5.17 Summary of Oligopoly in raw materials for steel production (2003)

	Main Companies (ratio)		Percentage of Export to vessel transportation
Iron Ore	·CVRD (Brazil) ·Rio Tinto (Australia) ·BHP.B (Australia)	36% 25% 17%	78%
Coal	·BMA (Australia) ·Elk Valley (Canada) ·Xstrata (Switzerland/Australia) ·Anglo (Australia) ·Rio Tinto (Australia)	26% 13% 8% 8% 7%	62%
Fe-Cr	·Xstrata (Switzerland/South Africa) ·Samancor (South Africa) ·Kazchrome (Kazakhstan)	23% 19% 13%	55%

Domestic markets have also experienced M&A and a shifting of production bases towards China and India, so that INI Steel has the second largest scale in the domestic market and will have the second largest integrated mill with approximately a 10milion ton capacity in four or five years. Production capacity of domestic steel makers will reach 70 or 80 million tons in 2010.

Together with the recent growth, Korean steel makers have coped with water insufficiency and water contamination of local areas, social responsibility issues that have been raised by environmental NGOs and neighborhoods. The globalization of the steel industry will undoubtedly bring about new issues such as human resource management, and expansion of their stakeholders.

③ Environmental Characteristics of the Korean Steel Industry

In the steel industry, generally speaking, there are two kinds of methods: the integrated steel mill (including blast oxygen furnace) and electronic arc furnace steel mill. Both use much energy and emit several environmental pollutants such as dust, and hazardous gases including CO_2 (See table 5.18).

Table 5.18 Environmental pollutants and wastes in Steel industry

Process \ Pollutants	Air Pollutants	Water Pollutants	Wastes
Up-stream (Iron, Steel, Continuous Cast)	· CO_2 · Dust · NO_x, SO_x · VOC · Dioxin	· Cl-, CN- · COD · F-	· Slag · Sludge · Dust · Wastes Refractory Material · Waste Residue Sand
Down-stream (Hot-rolling, Cold-rolling, Surface Coating)	· NO_x, SO_x	· COD · Cr^{+6} · F- · N	· Mill Scale · Wastes Refractory Material · Wastes Oil · Wastes acid

However, pollutant emissions by steel makers in Korea are still better than those of steel makers in advanced countries. For example, a high volume of wastes are been recycled. Table 5.19 shows environmental pollutants produced in the Korean steel industry.

Table 5.19 Environmental Pollutants in Korean Steel Industry

	Details Contents	Remark
Air Emission	· CO_2: 1.8kg/ton-iron	· 30% level compared with that of steel makers in advanced countries
	· SO_x, NO_x: 1.4kg, 1.5kg/ton-steel respectively	· The same level with steel makers in EU
	· Dust: 0.22kg/ton-steel	· Low level compared with that of steel makers in EU
Water Discharge	· NO_x	· Found in Rolling process of stainless works
Waste	· Slag: approximately, 15milion ton/yr (BOF slag : Converter Slag : EAF Slag = 56 : 28 : 16)	· Almost, recycled
	· Sludge: approximatel, 1.25milion ton/yr	· Recycling rates has rapidly been increased (e.g., ’96, 39%; ’00, 67%).
	· Dust: approximately, 1.5milion ton/yr (BOF:EAF = 77:23)	· Almost, recycled as a raw material of sintering plant, and 56% of EAF dust has been recycled. However, it contains ‘heavy metal including Pb, Cd, etc and valuable metal over 20%’.
	· Mile Scale	
	· Waste Refractory: 0.3milion ton/yr	· 100% recycling
	· Waste Residue Sand: 0.13mil. ton/yr	· 50% recycling
	· Waste Oil: 25,000ton/yr	· 70% recycling
	· Waste Acid: continuously increased (0.176mil. ton in 2000)	· Almost, treated in final treatment plant · Almost, recycling

Source: Interview and MOCIE

④ Technology trends focused on the ‘Integrated Steel Mill’

The United Kingdom has developed a wide range of technologies in the field of iron-making and steel-making process since the 1700s. Facilities or equipment technology and manufacturing technology have been advanced in Austria and German, and in Japan in the 1900s. The following are technology

trends:

- Iron-Making: A bigger Blast Oxygen Furnace has led to an increase in productivity, and new technologies based on automation and artificial intelligence is being pursued to continuously improve efficiencies. Recently, in order to cope with environmental issues and to improve efficiency, an environmental friendly iron-making process based on melting-reduction technology has been developed and will be commercialized between 2008 and 2010.
- Steel-Making: An LD converter based on smelting technology by pure oxygen has rapidly improved productivity and quality, and it will theoretically continue to improve quality.
- Continuous Casting: Thin Slab Continuous Casting technology[98] led by Germany and Japan was developed by the Korean steel industry in the 1990s, and since then, industry has worked hard to develop Strip Casting[99]. Its commercialization will also be achieved sooner or later.
- Rolling and Surface Coating: This technology was led by the USA and Japan and has focused on continuous rolling technology for productivity improvement and energy use reduction. Now, endless rolling technology has been developed and is en route to commercialization.

Also, EAF steel-making uses scrap steel as a main material and electric power for melting and smelting. The processes such as steel-making smelting, continuous casting, and the hot and cold - rolling are analogous to those of the integrated steel mill.

⑤ External Sustainability Analysis of Steel Industry

Table 5.20 and 5.21 provide the results of external sustainability analyses of the Korean steel industry and they are displayed in Figure 5.10 as a type of CVMS to identify easily the linkage between the traditional business factors and factors for CSM.

Table 5.20 Opportunity Analysis of the Korean Steel Industry

Non-Business Factor		Title of Factor	Influence on CSM Driving Forces (Evaluation Result)	
Economic Capital	Governance & Management	· Relatively, being improved awareness of international society regarding corporate governance of Korean companies	· Access to Capital, Reputation	.
	Information of Profit Flow	· Increased Demand for Profit or Benefit Sharing with the Companies	· Access to Capital	

[98] Thin Slab Continuous Casting refers to the technology for manufacturing hot-rolled steel sheets by directly rolling thin slabs, a technique reputed as one of the three most advanced steel making technologies along with melting-reduction-based steel manufacturing as well as strip casting technology (http://www.posco.co.kr).

[99] Molten iron is injected into a casting pool between two cylindrical rollers, and the rollers rotate and cool, immediately producing steel sheet without making a slab(http://www.posco.co.kr).

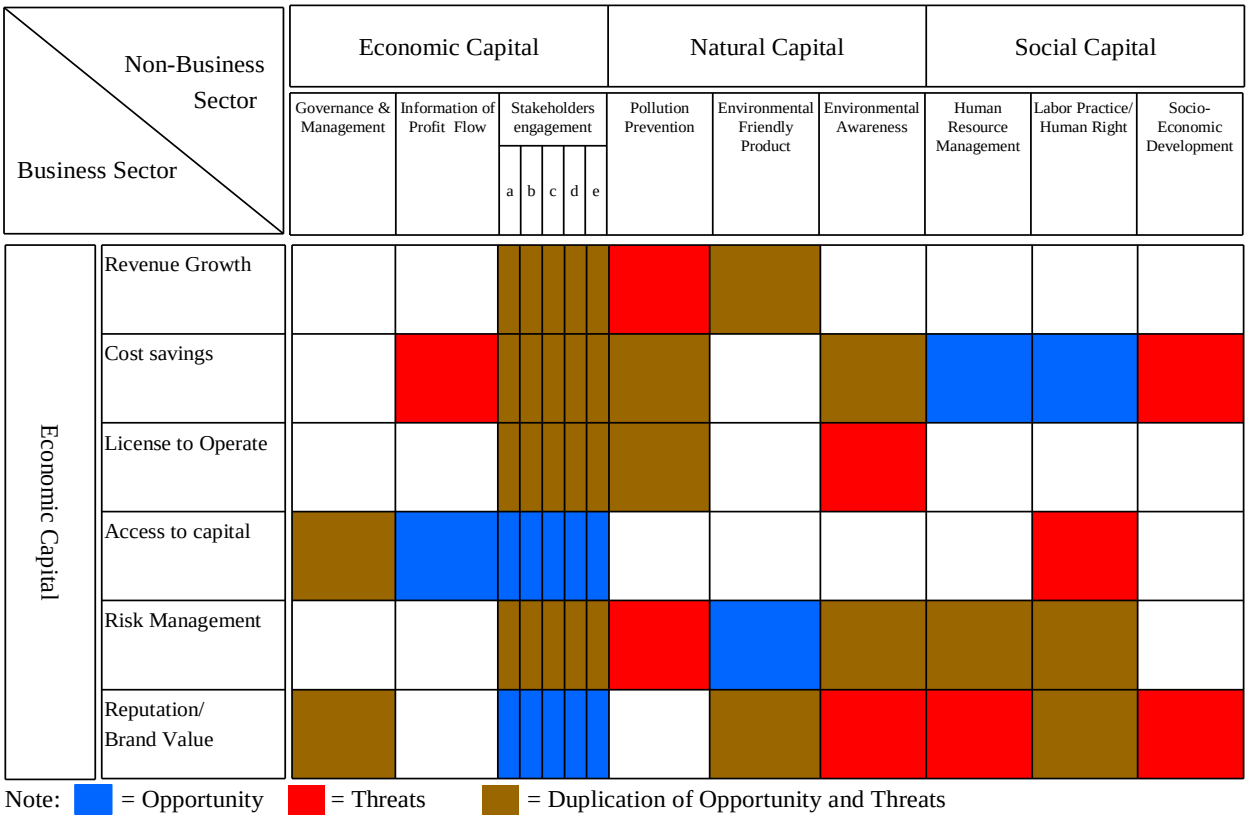
	Stakeholders Engagement	· Flourish of Global Economy · Gradual-recovering of domestic market · China's WTO Entry and proactive Openness Policy · Gradual Improvement of rationale of stakeholders including shareholders · Advanced Korean IT Industry: Competitiveness through IT technology and Network with its related industries · Proactive fostering industry policy by Korean Government · Geographical Nearness to Asia Countries including China, the most potential market in near future · Transparency of non-financial performance including financial performance and, recently, concerns on evaluation of corporate activities in sustainability perspectives	· Revenue · Revenue · Revenue · Risk Mgt. · Cost Saving, Risk Mgt · License to Operate · Revenue · Access to Capital, Reputation	
Nature Capital	Pollution Prevention	· Prompt Responsiveness of Korean Government according to business atmosphere for encouraging Korean industry in Cleaner Production sides · International and Domestic economic incentive tools like emission trading, etc.	· License to Operate · Cost Saving	
	Environmental Friendly Products	· Relatively, environmental-friendly product	· Revenue, Reputation	
	Environmental Awareness	· A wide range of education and training programs regarding environmental awareness · Being increased Suppliers' Importance for coping with a wide range of regulations	· Cost Saving · Risk Mgt.	
Social Capital	Human Resource Management	· Relatively, Better Quality of Human Resources in Korea	· Cost Saving, Risk Mgt.	
	Labor Practice/ Human Right	· Enough Experience with management system approaches through ISO 9000 series, ISO 14001, & OHSAS 18001, etc · Integrating standards of social responsibility of ISO 26000 series in 2008 in management system sides	· Cost Saving , Risk Mgt., Reputation · Cost Saving	
	Socio-Economic Development			

Table 5.21 Threat Analysis of the Korean Steel Industry

Non-Business Factor		Title of Factor	Influence on CSM Driving Forces (Evaluation Result)	
Economic Capital	Governance & Management	· Increased demands for transparency and Objectiveness of management in accordance with a wide range of international and domestic standards, Sarbanes-Oxely law, business ethics, etc	· Access to Capital, Reputation	
	Information of Profit Flow	· Increased Demand for Profit or Benefit Sharing with the Companies	· Cost Saving	

	Stakeholders Engagement	· World-wide Competitiveness Deepening, especially Korean Market · A fast-growing Least Developed among Developing Countries (LDDC) like China, India (so-called BRICs), etc · China's WTO Entry and proactive Openness Policy · Acceleration of deindustrialization · More wide range of stakeholders and frequently, their unreasonable arguments regarding sustainability arguments · Vertical alliance between mines and key steel companies · Importance of Raw Materials (including Unstable market situation of supply and demand for raw materials); Greater impacts of raw materials on Steel Price · Relatively, Weakness of Engineering and Operational Technology in higher value added steel · Strategic Alliance between leading steel companies and Global Oligopoly · Oversupply in the Global Market · An Import Regulation of Developed Countries including USA · Transparency of non-financial performance including financial performance and, recently, concerns on evaluation of corporate activities in sustainability perspectives	· Revenue, Cost Saving · Revenue, Cost Saving · Cost Saving · Risk Mgt. · License to Operate, Risk Mgt. · Revenue, Cost Saving · Revenue, Cost Saving, Risk Mgt. · Cost Saving · Revenue, Cost Saving · Revenue, Cost Saving · Revenue, Cost Saving · Cost Saving	
Nature Capital	Pollution Prevention	· International and Domestics regulations including conventions (e.g. Montreal Protocol, Kyoto Protocol, Stockholm Convention, etc) focused on products and substances based on IPP(eg, REACH) · International and Domestic economic incentive tools(eg, emission trading) · Comparatively Weak Envt'al Mgt of External Contractual Companies · Energy and Resource Intensive Industry · High-impact industry on environment	· Revenue, Cost Saving, License to Operate · Cost saving · License to Operate, Risk Mgt · Cost Saving · Cost Saving, License to Operate	
	Environmental Friendly Product	· The Environmental Friendly Product	· Reputation	
	Environmental Awareness	· Expansion of Ethics or Normative perspectives · Lower awareness regarding necessity of Environmental Management · Awareness of Suppliers' Importance for coping with a wide range of regulations	· Cost Saving, License to Operate, Reputation · Risk Mgt. · Cost Saving	
Social Capital	Human Resource Management	· Increased Requirements for Corporate Social Responsibility including Various Guidelines such as Global Compact, MNCs Principle, International Standards	· Risk Mgt., Reputation	
	Labor Practice/ Human Right	· Increased Demand for participation in Management · Increased requirements for corporate social responsibility including various Guidelines such as Global Compact, MNCs Principle, International Standards · International standards like SA 8000.	· Access to Capital · Risk Mgt., Reputation · Cost Saving,Reputation	
	Socio-Economic Development	· Proactive Social Activities of MNCs of global companies, especially in EU · Approach based on normative sides regarding the purpose of a firm	· Cost Saving, Reputation · Cost saving, Reputation	

Figure 5.10 External Sustainability Analysis of Korean Steel Industry



The impact of driving forces of economic capital such as governance/management, information of profit flow and stakeholder engagement on business factors is very similar to those of two industries. That is to say, stakeholder engagement is highly related to the results of business factors in both positive and negative perspectives. However, making an examination of stakeholders' activities and the characteristics by industry, in detail, some differences can be found. That is to say, suppliers and customers, including the public, are the crucial stakeholders in the case of electronics and automobile industries which produce the final consumer product. However, the core stakeholders in the steel industry where corporate value is created based on natural resources like iron ore, coal, and limestone, are the suppliers who supply raw materials. In accordance with a wide range of intensified environmental regulations, focused mainly on hazardous substances, emission pollutants, etc, three driving forces of natural capital have been evolved to impact revenue growth/market share, cost saving and licensing to operate in business factors based on risk management. The steel industry has been named as an 'energy intensive industry' and as an 'environment burden industry' which consumes huge amounts of energy and produces enormous amounts of pollutants. Therefore, risk management and reputation/brand value activities are crucial to achieve and to maintain sustainable competitive advantage in the global market. Three driving forces of social capital have a similar appearance with that of the Korean electronic and automobile industry. Compared with the Korean electronic and automobile

industry, steel industry has been acknowledged as an environmentally friendly good and as a basic material for humans. Therefore, the proactive social responsibility activities based on these kinds of characteristics can play a positive role in business sectors like risk management, and reputation/brand value.

⑥ Results of an Analysis of the Responses of POSCO

Table 5.22 and 5.23 are the evaluation results of a Korean core steel company in sustainability perspectives. The former show the results of 2002 activities and the latter show the results of 2004 activities. Figure 5.12 provides the impacts of each activity implemented by a Korean steel company on business factors in accordance with the criteria (See figure 2.9 in Chapter 2). Its calculation procedure is the same as that of a Korean core electronic company (See 5.3.1, p. 17).

The CEO's awareness of a Korean core steel company regarding sustainability has been expressed in a management philosophy as a way to grow continuously. He argues that his company will "serve the better solutions to pollution from manufacturing processes, global warming, and depletion of natural resource, and will pursue open stakeholder engagement to meet various stakeholders' challenges from every corner of the world for globalization." Together with the willingness of its CEO, most of its activities in economic capital have been carried out proactively to have a positive impact on all the parts of business factors. The revised strategic sustainability framework, the structure of the board of directors, and the establishment of its CSM Team in strategic planning division, may have contributed to risk management and reputation/brand value. Its activities related to profit flow are meaningful on economic capital in the business sector through access to capital and reputation/brand value. Its activities related to stakeholder engagement are right considering its external sustainability analysis. Together with relatively clearer information about profit flow for stakeholders, it has strived to have much safer relations with raw material's suppliers, to introduce a 'benefit sharing program with external service suppliers' based on the evaluation and all payments for SMEs clearance system within three business days in cash the tax slip issued, to pursue partnerships with customers, and to conduct verification and assurance by a public trusted third party. Therefore, excluding NGOs, relationships or engagement with most stakeholders has a positive impact on economic capital of this business sector through most parts excluded from a license to operate. Recently, it has suffered from its relationship with NGOs, particularly environmental NGOs. Due to their strong demands, as of 2004, it has established too great waste treatment facility in capacity based on Korean environmental law perspectives. In this manner, NGOs have an influencing power on cost saving and license to operate. Therefore, it preferably will improve its relationships with NGOs. Considering its overseas expansion to China, India, and Brazil, its relationship with NGOs is an additional basic factor for achieving sustainable competitive advantage in the global market.

Its responses regarding natural capital seemed to be, by and large, implemented in accordance with

external sustainability analysis of the Korean steel industry. They have mainly focused on pollution prevention in order to improve economic capital in the business sector through revenue growth, cost saving, and licenses to operate based on risk management. Two typical cases are Finex and the strip casting process. Both are not commercialized but they almost achieved the go-ahead for commercialization. Both of them will cut operating costs largely with the reduction of energy consumption and environment pollutants, and will also intensify their sustainable competitive advantage through exporting engineering technology. However, its activities related to environmental awareness should be improved. Its activities must be changed to include the local community and NGOs. Particularly, environmental awareness must be emphasized and they should use the characteristics of steel in environmental perspectives.

Its responses, which have not considered the characteristics of the steel industry, regarding social capital, should be improved considering the external sustainability analysis of the Korean steel industry, even though meaningful activities such as distribution of can contained flower seed, and supply of pipes for vinyl hoses (plastic hoses were implemented in 2004. Furthermore, they have mainly focused on reputation/brand value for sustainable competitive advantage. Its activities must consider the argument of Porter and Kramer (2002).

Taken, with the results of external sustainability analysis regarding a Korean steel industry, its stabilized and economic procurement of raw materials through contracts with CVRD, BHP, Canada Mining Company, joint ventures with mining companies, and continuous R&D activities and improved its performance on energy efficient and environmentally friendly processes such as FINEX, strip casting htat are greatly contributing to its sustainable competitive advantage through maximization of its opportunities and neutralization of its threats. As well, corporate governance, information of profit flow, ‘verification and assurance’ activity implemented by an international, trusted, third party in economic capital are highly appreciated as a global leading steel company in transparency and objectiveness perspectives. However, in order to efficiently improve stakeholder engagement, stakeholder analysis must be regularly carried performed that the accurate identification of its stakeholders and their needs is possible. Environmental awareness activities should be intensified together with the importance of natural resources. The framework of strategic sustainability management has also been more systematic compared with that in 2002, and its ethics activities should be placed in a suitable position in its strategic sustainability framework as soon as possible in order to enhance its clearness. In the meanwhile, its social activities are not enough as a global leading company. A wide range of social activities which reflect the characteristics of its business and location should be intensified and developed to move from indirect factors like reputation to direct factor such as cost saving and revenue growth.

Table 5.22 Sustainability Activities Evaluation Result of POSCO in 2003

Non-Business Factor		Title of Activity	Contribution to Sustainability Frontier Curve Through (Evaluation Result)
Economic Capital	Governance & Management	· CEO Message: Better solutions to pollution from manufacturing processes, global warming, and depletion of natural resource; abide by strict corporate ethics; pursue open stakeholder engagement	· Revenue, Risk Mgt., Reputation (④)
		· Strategic Framework: Ambiguous philosophy framework in sustainability perspectives: Corporate Ethics as Business Principle, however ambiguous terminology like Ethical Management and therefore conflicted with management philosophy (Fair Trade	· Reputation (①)
		· More independent or objective Board of Directors: Total 14/ 8 outside (2 non-Korean) and 6 standing directors	· Access to Capital, Risk Mgt. (③)
		· Sustainability Organization: Temporary Task Force Team	· Risk Mgt. (①)
	Principle of Profit Flow	· Supplier of Capital (Stock Payback, Dividend and Interest), Management (Compensation of Directors and Officers) & Employees[Profit sharing principle (profit sharing ratio from 4.5% to 5.5% of operating income)], Customers, Suppliers, and Business Partners(Benefit Sharing Program), Central and Local Governments(Tax)	· Access to Capital, Reputation (③)
	Stakeholders Engagement	· Dialogues with a wide range of Stakeholders (but, No opinion views of stakeholders): Shareholder (IR Excellent Company by KSEC, Proactive R&D like Finex Demo Plant etc), Supplier (Joint Venture Mining Companies with BHP), Employees(Org. for Improvement & Six Sigma), Customer (TWB, Hydro-forming Products etc), The Communities (Environmental Data Disclosure)	· Risk Mgt. (②)
		· Environmental Accounting in Development and Testing Phase	· Risk Mgt., Reputation (②)
		· ISO 9000 and ISO 14001 Audit and Verification and Assurance in relation to a selected sample of 100 data and statement	· Access to Capital, Reputation (③)
Nature Capital	Pollution Prevention	· Environmental Assessment regularly	· License to Operate, Risk Mgt. (③)
		· FINEX: Start –up Demonstration Plant of 0.6million tons in May 2003	· Revenue, Cost Saving (③)
	Environment Friendly Products	· No of Development of Environmental Friendly Products: 25 in 2003 (particularly, high-performance, value-added products and recycling byproducts)	· Revenue, Reputation (③)
		· Supply Chain Environmental Management (mainly led by Environmental Planning Division)	· Risk Mgt. (②)
	Environmental Awareness	· POSCO WEBZINE: “Green World”	· Reputation (②)

Social Capital	Human Resource Management	· Various Learning Opportunities: Self-directed learning Culture, Online-Educational Programs, Offsite Work Experience and Studies · Knowledge Management System	· Cost Saving (②) · Cost Saving (③)	
	Labor Practice/ Human Right	· Employee Compensation: Welfare Benefits, In-house Venture System, Green Life Education Program · Health and Safety · Human Rights: Prohibited discrimination, Child and Force Labor	· Reputation (②) · Risk Mgt. (②) · Reputation (②)	
	Socio-Economic Development	· Volunteerism at Corporate Level · Regional Community Educational Support · Culture and Arts Support · Sports: Especially, Soccer · Support of Regional Economies · Financial Donations	· Reputation (②) · Reputation (②) · Reputation (①) · Reputation (②) · Reputation (②) · Reputation (①)	

Note: The number in the parentheses means the results which activities of POSCO were evaluated based on the criteria presented in Figure 2.7

Table 5.23 Sustainability Activities Evaluation Result of POSCO in 2004

Non-Business Factor		Title of Activity	Contribution to Sustainability Frontier Curve (Evaluation Result)	
Economic Capital	Governance & Management	· CEO Message: Meeting various stakeholders from every corner of the world for globalization. · Strategic Framework: More concrete its Framework than that of 2003: Business Ethics as Business Principle, however terminology like Ethics Management is very ambiguous and is conflicted with management philosophy (Gift-returning Center, Internal Control, Fair Trade) · More independent or objective Board of Directors than 2003: Establishment of Corporate Governance Charter, Total 15/ 9 Outside (3 non-Korean), 6 Standing Directors · Establishment of its CSM Team	· Risk Mgt. (③) · Reputation (②) · Access to Capital, Risk Mgt. (④) · Risk Mgt.(②)	
	Principle of Profit Flow	· Customer (Composition of Sales by Product, and Domestic and Export Ratio of Sales including Sales by Region), Employees[Profit sharing principle (profit sharing ratio from 4.5% to 5.5% of operating income) including labor cost], Compensation of Directors and Officers, Suppliers(All payments for SMEs cleared within three business days in cash the tax slip issued,), Shareholders and Investors (Stock Payback, Dividend and Interest, Stability of its Dividend Disposition), Public Sectors(Taxes, Donation)	· Access to Capital, Reputation (④)	

	Stakeholders Engagement	· Shareholder: Dividend including Interim · Global Steelmaking System and Stabilized and Economic Procurement or Raw materials (Contract with CVRD, BHP, Canada Mining Co. etc.) · Benefit Sharing with Outside Service Partners · Continued Management Innovation & ESOP: Employees · Customer with Partnership (e.g. Auto) · Communication with a wide range of Stakeholders (p. 13, 2004) including Environmental Data Disclosure to Pohang and Gwangyang · Environmental Accounting System · ISO 9000 and ISO 14001 Audit and Verification and Assurance on the data on financial performance(reasonable assurance) and on its total energy consumption and lost-time injury frequency rate (limited assurance)	· Access to Capital, Reputation (②) · Cost Saving, Risk Mgt (④) · Risk Mgt. (③) · Risk Mgt. (③) · Revenue, Risk Mgt. (④) · Risk Mgt., Reputation (②) · Risk Mgt., Reputation (②) · Access to Capital, Reputation (③)	
Nature Capital	Pollution Prevention	· Life Cycle Assessment · FINEX: successful operational results	· License to Operate, Risk Mgt.(③) · Revenue, Cost Saving, (④)	
	Environmental Friendly Products	· Life Cycle Assessment · No of Development of Environmental Friendly Products: 0 in 2004, but task force for Cr-Free Steel · Green Purchase and Supply Chain Environmental Management (mainly, led by Environmental Planning Division)	· License to Operate, Risk Mgt. (③) · Risk Mgt. (②) · Risk Mgt. (②)	
	Environmental Awareness	· Environmental Management as the intra-company online training course (as of 2004, 2,300 employees completed) · POSCO WEBZINE: "Green World"	· Risk Mgt., Reputation (②) · Reputation (②)	
Social Capital	Human Resource Management	· Communication with Employees: Labor-Management Council, The Young Board, Employee Engagement Survey · Education and Career Management: Self-directed learning Culture, Online-Educational Programs, Offsite Work Experience and Studies · Knowledge Management System · Support of Nurturing Talents of Subsidiaries and Outside Service Partners	· Reputation (②) · Cost Saving (②) · Cost Saving (③) · Risk Mgt., Reputation (③)	
	Labor Practice/ Human Right	· Employee Compensation: Welfare Benefits, Green Life Education Program, In-house Venture System · Health and Safety	· Reputation (②) · Risk Mgt. (②)	
	Socio-Economic Development	· Education and Scholarship · Eco-Industrial Parks at Pohang · Culture and Art, Physical Promotion Activities, 1% Club, and POSCO Volunteers · Flower Can Distribution · Supply the Pipes for Vinyl House · Volunteer Mileage Scheme	· Reputation (②) · Reputation (③) · Reputation (②) · Reputation (④) · Reputation (④) · Reputation (②)	

Note: The number in the parentheses means the results which activities of POSCO were evaluated based on the criteria presented in Figure 2.7

Figure 5.11 Actual Response Analysis of POSCO

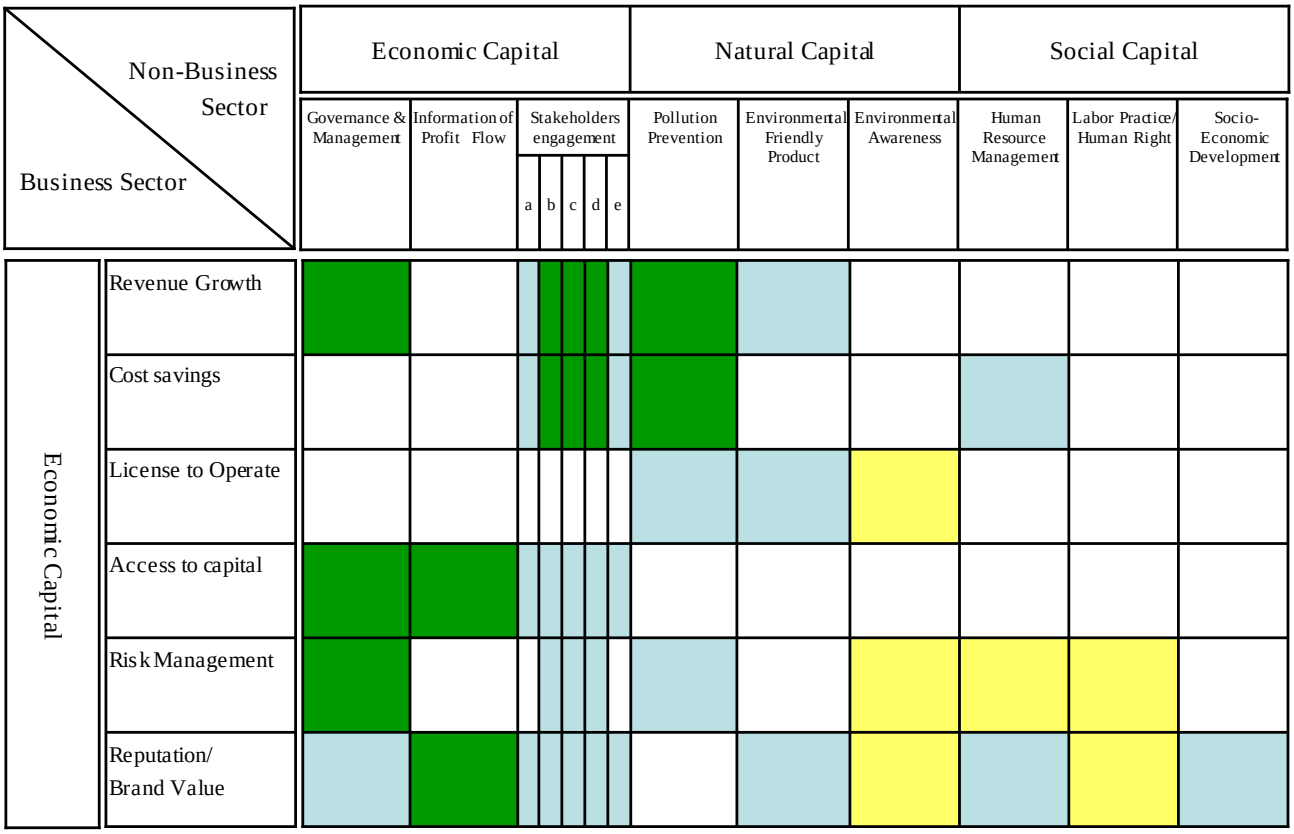
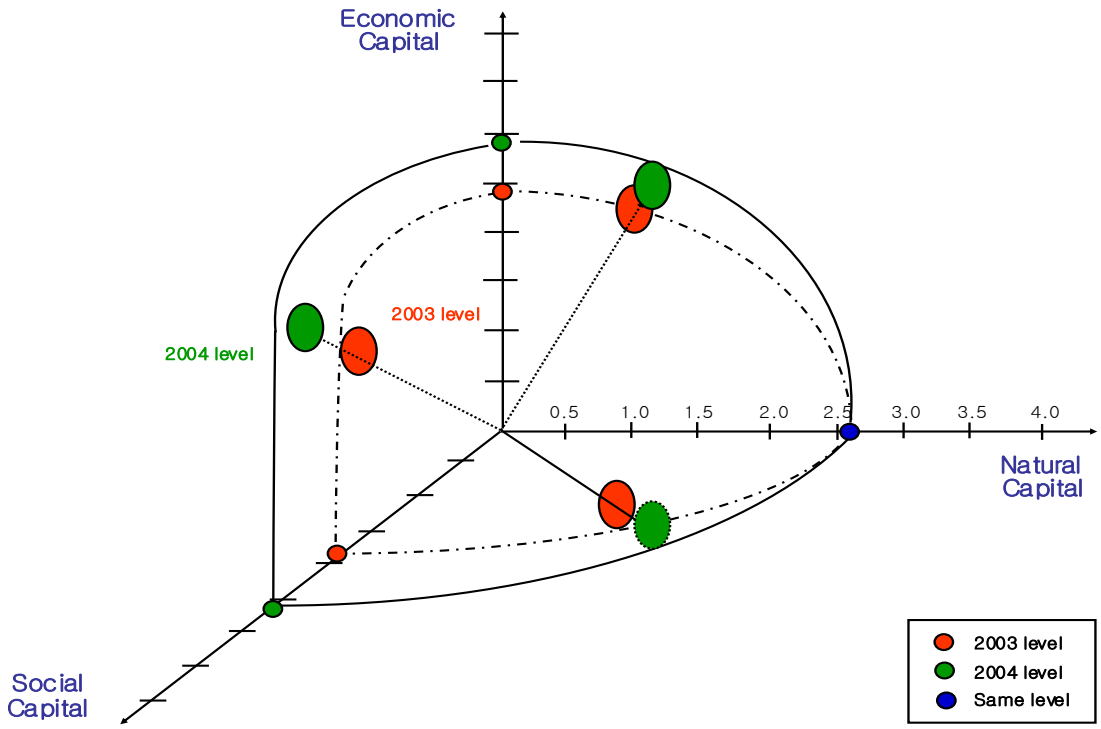


Figure 5.12 provides a depiction of the gaps between 2002 and 2004 of the sustainability possibility frontier curve (SPFC) in POSCO. In the case of POSCO, the level of SPFC in 2004, on the whole, was more enhanced than the level in 2002. However, because innovative environmental technology related to production processes and products are not easily developed, even though development of environmental friendly products has been continued proactively, the level of nature capital in 2004 was not changed compared with the level in 2002. In practice, the improvement activities for the steel processes such as Finex, strip casting technology have been continued, however, the commercialization of both technologies will take more time, and development of environmentally friendly steel product was not implemented in 2004. However, a task force team for development of Cr-free steel, in accordance with the EU environmental law, was set up in 2004. The improvement of economic capital is mainly due to proactive activities related to governance and management like improvement of the framework of strategic sustainability management and the objectiveness of the structure of a board of directors, information of profit flow, and a stronger engagement of stakeholders such as raw material suppliers, external service suppliers, customers, and a publicly trusted third party's verification and assurance about its sustainability activities. However, the use of ethical management, which is an admittedly ambiguous concept, should be properly positioned as a business principle (See the p.23). Its

improvement of social capital may be accomplished by proactive activities related to socio-economic development.

Figure 5.12 Gaps between 2002 and 2004 of Sustainability Possibility Frontier Curve in POSCO



Note: The direction of the variation is more important than the distance of that. The upward move means the improvement of the level of sustainability management.

5.3.2 Internal Sustainability Analysis for a Korean Steel Company

Three leading Korean companies in sustainability management have worked to integrate the TBL in non-business sectors into traditional economic capital in business sectors in order to achieve sustainable competitive advantage and enhance corporate value. The effective enhancement of a firm's competency based on a firm's resources should begin from the identification of a firm's resources. Therefore, this dissertation research was performed to identify the sustainability competency of a Korean steel company. The questionnaire is presented in Chapter 4 and appendix B, in detail.

Together with the analysis based on the checklists, the rating results of the publicly trusted third party rating institutes such as SAM, KLD, and EILiS, it is helpful to identify the areas to be improved in sustainability management perspectives. Among international rating institutes, the concept and the evaluation criteria of 'corporate sustainability' defined and established by SAM, seems to be analogous with those of corporate sustainability management defined in the dissertation. Therefore, the result surveyed in the dissertation was analyzed with the evaluation result carried out by SAM. The results in

the dissertation were graded on a scale of one hundred points. However, both results were not directly compared, and were simply classified with strengths and weaknesses fields. There are three reasons for this: first, the evaluation criteria are a little different, second, there is a great awareness gap between assessors of SAM and employees of a Korean steel company regarding the evaluation criteria, and third, the dissertation was designed to identify objects to be improved in order to achieve sustainable competitive advantage and to efficiently enhance corporate value.

Table 5.24 The Comparability of SAM DJSI 2005 and Survey Result in the Dissertation

Evaluation Item		SAM DJSI	Survey Result	Remarks
Economic Capital	・Corporate Governance	75	76	
	・Investor Relation	100	82	
	・Risk Management	95	78	
	・Code of Conduct	94	84	・This item was included in the 'Leadership & Management Philosophy' of the survey
	・Customer Relation	95	84	
	Average	92	81	
Natural Capital	・Environment Policy/ Management	88	84	
	・Environment Performance	81	82	
	・Environment Performance Reporting	75	81	
	・Advanced Environment Performance	52	82	・The item was integrated into 'Environment Performance' in the Survey.
	・Advanced Environment Management System	70	84	
	・Climate Change Strategy	80	83	
	Average	74	83	
Social Capital	・Human Right & Labor Practice	83	79	
	・Human Resource Development	94	79	
	・Talent Attraction & Retention	65	74	
	・Stakeholder Engagement	95	75	・The item was evaluated as one of Economic Capitals in the Survey.
	・Philanthropy	61	82	
	・Social Performance Reporting	69	79	
	・Social impacts on Communities	65	80	
	・Safety and Health	73	86	
	・Standards for Suppliers	91	81	・The item was evaluated as one of Economic Capitals in the Survey.
	Average	77	79	

The approach to classify strengths and weaknesses is in accordance with the analysis criteria mentioned by SAM. Whenever it announced the companies included in the universe of SAM DJSI, it

always provided an average score by industry and a score of best practice company for each the evaluation criteria. Together with these scores, cases scored ‘less than an average score by industry’ and ‘under 70% over the score of best practice company’ are classified with ‘the important items to be improved greatly’, and cases scored ‘under 85% over the score of best practice company’ are classified with as ‘items to be improved a little.’ In this dissertation, accordingly, the results surveyed by SAM and the author of the dissertation are classified with the strengths and weaknesses in accordance with the following criteria as:

[**SAM Results**]

- Strength Case: More than 85% over the score of best practice company
- Weakness Case: Under 85% over the score of best practice company

[**Dissertation Results**]

- Strength Case: More than an average score of each the Economic, Natural, Social Capital
- Weakness Case: Under an average score of each the Economic, Natural, Social Capital

Table 5.25 Sustainability Strength and Weakness of a Korean Steel Company

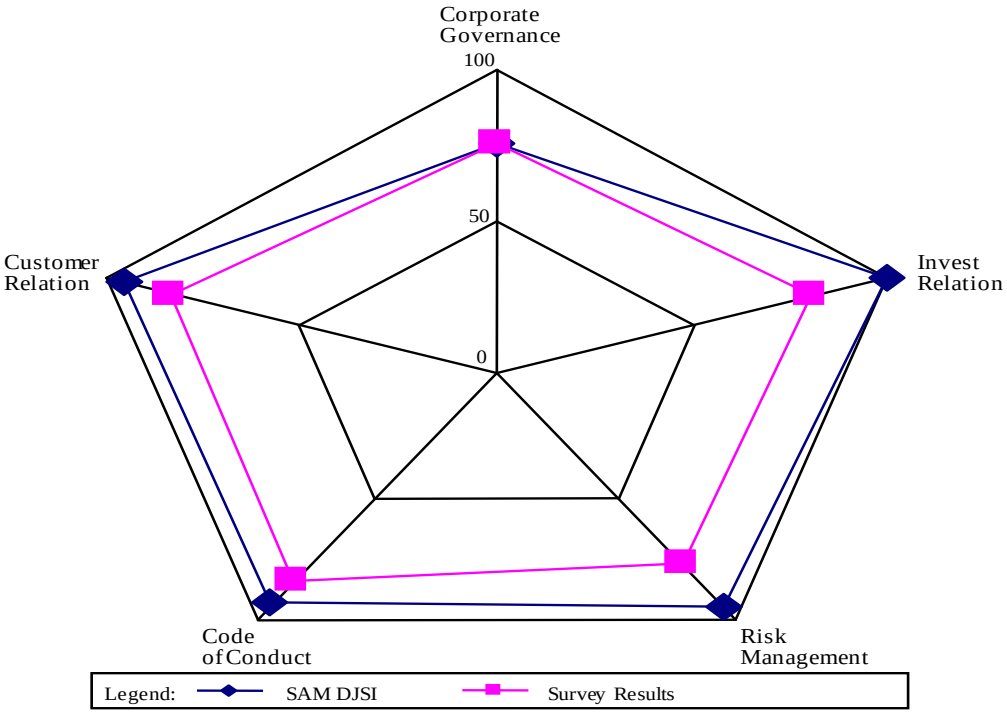
		SAM DJSI	Survey Result in the Dissertation
Strength	Economic Capital	·Code of conduct and anti corruption ·Investor Relation ·Risk Management ·Customer Relation	·Finance ·Management Philosophy ·Customer Relation · Strategic management and planning ·Investor Relation ·Operation and Process Control ·Procurement · Management Review (Performance Measurement and Reporting)
	Natural Capital	·Environmental Performance ·Environment Policy/Management ·Climate Change Strategy	· Environmental accidents, suits, punishments and fines, etc · Energy and Water Efficiency · Environmental Policy and management · Climate Change · Monitoring and environmental performance measuring · Environmental Pollutant Emissions
	Social Capital	·Human Resource Development ·Stakeholder Engagement ·Standards for Suppliers ·Talent Attraction & Retention ·Safety and Health ·Human Right and Labor Practice ·Social Impacts on Community	·Labor Practice ·Local Community
Weakness	Economic Capital	·Corporate Governance	· Product Control (i.e., Quality Control and R&D) · Risk management and planning · Corporate Governance · Public Relations and Communication · Stakeholders management

	Natural Capital	·Environmental Performance Reporting · Advanced Environment Management System ·Advanced Environmental Performance	· Procurement of raw materials and efficiency · Supplier and External Service Partner · Environmental Performance Reporting & Management Review · Environmental Stakeholder Management · Environmental Friendly Product and Cleaner Production Processes
	Social Capital	·Social Performance Reporting ·Philanthropy	· Social Responsibility Policy · Human Rights · Social Performance Reporting and Communication · Human Resource Mgt.

① Economic Capital

The results of the survey regarding strength factors of economic capital, of the Korean steel company are is in accord with the analysis result regarding actual responses carried out by the company. However, employees of a Korean steel company thought that product control (i.e., quality control and R&D) and corporate governance, which have responded proactively over the external sustainability atmosphere of a Korean steel industry, are weak points. Risk management, public relations and communications, and stakeholder management should be strengthened soon in order to achieve and maintain sustainable competitive advantage. Employees were satisfied with its activities regarding operation and process control; however its product control should be improved. Meanwhile, the evaluation results provided by SAM are also similar with the survey results conducted for an object of its employees (risk management item was excluded in the survey for an object of its employees) (see figure 5.13, table 5.25).

Figure 5.13 Strengths and Weaknesses of a Korean Steel Company in Economic Capital



These results are helpful to choose the preference for which factors of its resources or related TBL driving forces in non-business factors should be addressed in order to achieve and maintain sustainable competitive advantage. However the following should be carefully evaluated for strategic options:

- **The criterion has an impact on the result**. That is to say, the evaluation result by SAM is based on best practice company globally, but the survey result of dissertation is based on an average score evaluated by each capital. Therefore, both consequences are contrary to each other in case of its governance. SAM evaluated it as a weak point. However, the author of this dissertation considered its activities regarding governance valuable and rare, namely better activity. In practice, its governance was relatively better transparent structure than those of other two companies analyzed based on CVMS (Chapter 4) in the dissertation. The reason is that the analysis criteria for its real responses were considered to be due to the influence on sustainable competitive advantage or corporate value through traditional economic capital in the business sector based on sustainability.
- **The awareness and scope has an impact on the result**. In case of risk management, SAM evaluation, and employees' awareness and analysis regarding its actual responses in the dissertation are different. As well, in case of stakeholder engagement, SAM and analysis of dissertation regarding its actual responses, and employees' awareness in the dissertation were contrary to each other. These kinds of results are due to the differences of applied scope and awareness regarding risk management and stakeholder engagement. Table 5.26 provides the main point of view when they evaluated its activities regarding sustainability.

Table 5.26 The Main Points of View of each Assessor

	SAM DJSI	Author of the dissertation	Its Employees
Risk Management	Financial Risk	Financial and Non-Financial Risk	Financial and Non-Financial Risk
Stakeholder Management	Social and Economic Stakeholders	All the stakeholders, but focusing on the relationship with economic capital in business sector	Mainly, environmental Stakeholders

② Natural Capital

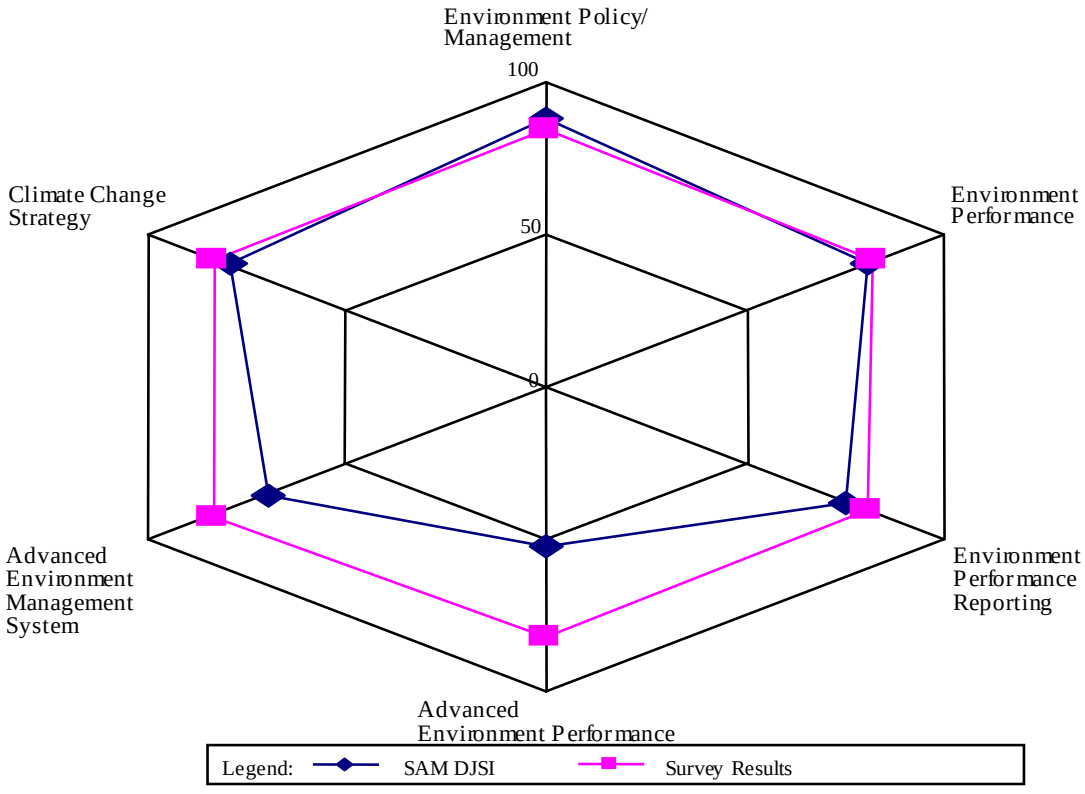
The employees provided some interesting points of view regarding natural capital. They argue that procurement is the strong point in economic capital perspectives, but its activities related to raw materials should be improved in a natural capital perspective.

On the whole, SAM and its employees provided a similar evaluation result in which its activities related to the 'plan and check' stage are better, but its activities related to the 'do and act' stage should be improved. Finex and strip casting methods for process innovation, development of environmentally friendly products, and the relationship with environmental stakeholder engagement, and environmental

reporting should be clearer and more advanced. In this regard, SAM's results which evaluated its activities such as advanced environmental management systems, advanced environmental performance, and environmental performance reporting as a weakness, is in accordance with its employees' points of view(see figure 5.14).

In addition, in the course of the interviews and literature reviews, the author of this dissertation confirmed that the company has suffered from a relationship with environmental stakeholders and received fines in 2004 because of wastewater treatment and hazardous substances. In spite of its policy related to climate change not being clear and its activities related to climate change not being sufficient to enhance its sustainable competitive advantage, the author of this dissertation is aware through the survey that its employees viewed them as a strength. These kinds of results are due to insufficiency and inequalities in information in the interview and the analysis of the company's real responses regarding environmental awareness based on CVMS (see Figure 4.6) in the dissertation was presented.

Figure 5.14 Strengths and Weaknesses of a Korean Steel Company in Natural Capital

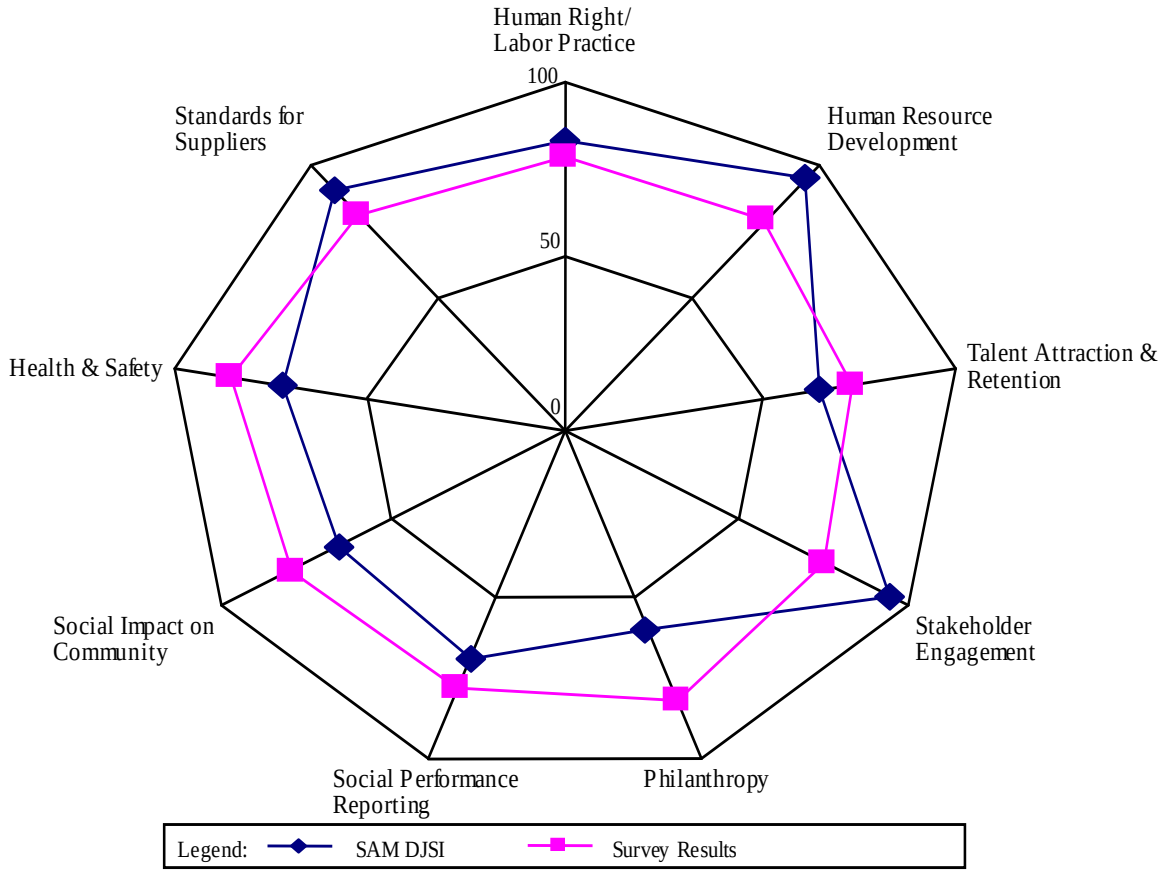


③ Social Capital

The author of this dissertation argues that this company's social activities should be improved through its CVMS analysis (see p. 48 in Chapter 5). The evaluation results by SAM perspective are better than the results of the interviews performed by this dissertation author; that is to say, SAM evaluated most

social activities as strength points excluding social performance reporting and philanthropy activities, while the company's employees also considered labor practices and local community as strength points. However, the employees have a different perspective in the human resource management activities from SAM's view. From these kinds of results, the company's human resource management should be improved in order to achieve and maintain sustainable competitive advantage. Its labor practice/human rights and social economy development should be more focused to be linked with the characteristics of the firms' business, so that it can achieve sustainable competitive advantage and enhance corporate value (see figure 5.15).

Figure 5.15 Strengths and Weaknesses of a Korean Steel Company in Social Capital



5.4 Summary and Conclusions

The author in this dissertation presents evidence regarding Research Questions 2 and 3. In order to seek answers to them, the author carried out a case study of three Korean companies (electronics, automobile and steel industries), which are leading in implementation of sustainability management in Korea, on the basis of the CVMS model (see Chapter 4). A study was implemented to search for

resource based perspectives to be improved in the case of a Korean steel company based on the checklist provided in the Chapter 4. Below is a summary of the results of the case study:

[***Research Question 2***] *Is the direction of corporate sustainability strategy in Korean companies appropriate for sustainable growth of the companies?*

- Strategic activities of Samsung SDI are suitable for making full use of its opportunities and making a mitigation of threats based on external sustainability analysis. In particular, R&D activities in stakeholder engagement of economic capital, pollution prevention and environmentally friendly product activities to improve their natural capital performance, which are judged as the best preference based on external sustainability analysis of the electronic industry, have contributed to achieving sustainable competitive advantage in the global market. A strategic framework for sustainability management has also been revised by adding its management principle between its management philosophy and strategic options. The author of this dissertation argues that a management or business principles is imperative considering a wide range of principles and standards, and stakeholders related to corporate sustainability management (See Chapter 4). However, many activities must be continuously improved for sustainable growth. Particularly, some activities for enhancing economic capital must be revised; that is to say, it must conduct stakeholder analysis regularly, and then on the basis of the accurate identification of its stakeholders and their needs, its sustainable strategic options should be chosen. Perhaps, the stakeholder analysis itself will enhance its transparency and objectiveness. Then, information or the principle of its profit should be presented to all stakeholders in a transparent manner. Finally, a verification activity regarding its sustainability report must be improved with the highest priority. If it needs to create revenue or market share in the global market, if possible, an internationally publicly trusted third party should conduct the verification and must get a management letter of ‘assurance’. In addition, the company’s social activities which can directly improve its value should be continuously reinforced, even though its sustainability effort and the subsequent reputation/recognition is in good standing..
- Continuous R&D activities of Hyundai Motor are appropriate including hybrid and fuel cell cars in order to get over the external sustainability atmosphere such as rigorous domestic and overseas standards regarding fuel efficiency, pollutants emission, and hazardous substances. The verification and assurance activities conducted by internationally trusted third parties are also appropriate and desirable as a global leading automobile maker in the transparency perspective. However, considering environmental characteristics of a car which consumes fossil fuels and emits pollutants on a large scale, environmental awareness activities of natural capital and economic development activities of social capital must be linked in more closely manner. Recently, a wide range of social economic development activities such as voluntary recall, 24-hour emergency vehicle rescue, children traffic safety campaign, free check for disable people, islands area, and donation of ambulances to Africa were carried

out. However, those activities did not consider the importance of energy and environmental issues, which are the major priority in the sustainability of a Korean automobile industry according to external sustainability analysis. Additionally, R&D activities for improvement of energy and environmental issues should be focused on cost reduction to achieve sustainable competitive advantage. At the same time, its stakeholder analysis carried out in 2003 for enhancing continuously economical capital must be conducted regularly to identify its stakeholders and their needs. The framework of strategic sustainability management has also been much more systematic compared with that in 2002. However, its ethical management was not given a proper position in its strategic sustainability framework. Because of this reason, its management philosophy and its purpose have been a little ambiguous.

- In accordance with the results of the external sustainability analysis regarding Korean steel industry, POSCO's stabilized and economic procurement of raw materials via contracts with mining companies such as CVRD, BHP, Canada Mining Company, joint ventures with mining company, and continuous R&D activity over energy efficient and environmental friendly processes such as FINEX, strip casting in natural capital, greatly contribute to sustainable competitive advantage through maximization of its opportunities and neutralization of its threats. In addition, corporate governance, information of profit flow, and 'verification and assurance' activities implemented by internationally trusted third parties are highly appreciated as a globally leading steel company in transparency and objectiveness perspectives. However, in order to improve stakeholder engagement, stakeholder analysis must be regularly carried out so that accurate identification of its stakeholders and their needs is accomplished and appropriate responses are made. Environmental awareness activities should be intensified together with the importance of natural resources. Although the framework of strategic sustainability management has been more systematic compared with that in 2002, its ethical management should be given a suitable position in its strategic sustainability framework as soon as possible in order to enhance its clearness. Its social activities up until now are not enough for a globally leading company. A wide range of social activities which would reflect the characteristics of its business and location should be intensified and developed to move from indirect factors such as reputation to direct factors such as cost reduction and revenue growth.
- Together with strategic adoption of the TBL approach to enhance the firm's resource capability, this dissertation presents results of a survey that was given to employees of a Korean steel company (POSCO) regarding strengths and weaknesses in sustainability perspective (see 5.3.2)[100]. According to the view of evaluators, the same activities can be evaluated differently. Typical examples in the case of the Korean steel company are the results of evaluation for activities related to FINEX, stakeholder engagement, and human resource management. SAM DJSI had a positive opinion of three activities

[100] The other two Korean companies in this dissertation could not be applied to these checklists due to information securities.

such as FINEX[101], stakeholder engagement, and human resource management, but its employees did not score very high relatively. Through the survey, the author of this dissertation is aware that the view of its employees regarding its sustainability activities comparing with the view of SAM DJSI is a little different, and that the interpretation or analysis of information is important to make a decision on strategic options for enhancing sustainable competitive advantage. Therefore, strategic directions and options must be selected based upon the premise of identification and upon the opinion of core stakeholders, as well as upon elaborated analysis about internal resource capability.

[***Research Question 3***] *Why have Korean companies tried to integrate sustainability into corporate strategy?*

- Research Question 3 concerns the reasons why Korean companies are working to integrate sustainability into their strategic management. The author of this dissertation hypothesized that it may be helpful to enhance sustainable competitive advantage and corporate value in the long-term. In the research, sustainable competitive advantage and corporate value were measured as a 'sustainability frontier curve' which reflects the level of the relationship between TBL in non-business sectors, and traditional economic capital in business sectors. CVMS in the dissertation is a model in order to confirm the relationships between financial sector and non-financial sector on the basis of business management activities of case companies (see figure 4.6). The criteria for evaluation were explained in Chapter 2. In this dissertation, the sustainability possibility frontier curve of the three Korean companies in 2002 and 2004 respectively were depicted for comparability. It was confirmed that all the sustainability possibility frontier curves of the three companies have been improved. However, their interactions with their natural capital have not yet made progress. Rather, that of the Korean electronic company was decreased in natural capital interaction score. However, this dissertation author does not draw the conclusion that this company has not taken efforts to improve environmental performance. Rather, he would like to suggest that a diversity of factors such analysis period, research approach, and environmental R&D characteristics should be taken into consideration, when researchers for future study related to this dissertation wish to build upon these research findings.

To conclude, sustainability management of the three Korean companies considers strategic options in order to achieve improved sustainable competitive advantage, based on the external sustainability

[101]The **FINEX** process is an innovative, next generation iron making technology developed by Siemens VAI and POSCO. Molten iron is produced directly using iron ore fines and non-coking coal rather than processing through sintering and coke making which had been essential to traditional blast furnace methods. Because the preliminary processing of raw materials is eliminated, the construction of the FINEX plant costs less to build than a blast furnace facility of the same scale. Furthermore, a 10-15% reduction in production costs is expected through cheaper raw materials, reduction of facility cost, pollutant exhaustion, maintenance staff and production time. In addition, it is eco-friendly in that it produces less pollutants such as SO_x, NO_x, and carbon dioxide than traditional medthods (http://en.wikipedia.org/wiki/**FINEX** and //www.posco.co.kr/homepage/docs/en/s91a0010001i.jsp).

analyses of each company. However, some activities of the three Korean companies did not help to improve sustainable competitive advantage, based on the analysis criteria applied in this dissertation (see Chapter 2 and 5). These strategic options should be improved and intensified, mainly considering the characteristics of each industry for sustainable competitive advantage. In addition, the views of employees and international rating institutes should help corporate leadership decide and enhance internal resource comparability with strategic directions for sustainable competitive advantage.

In particular, this author confirmed that the strategic framework for sustainability management depicted in figure 4.8 can strengthen corporate sustainable competitive advantage and ultimately enhance a firm's value on the basis of the CVMS model. That is to say, analyzing the three Korean companies based on CVMS model, this dissertation author found general points in the strategic framework for sustainability management as follows;

- Management philosophy was not fully linked with the corporate strategy for sustainability management.
- Business ethics and a 'code of conduct' have already been adopted, however, their role is very ambiguous from the strategic framework perspective. In addition, business or management principles for implementing their sustainable activities were not clearly evident.
- Indicators based on eco-efficiency were used, however, indicators to measure social activities were not.
- Sustainable activities were not evaluated from the perspective of corporate values.
- The Sustainability reports are regularly verified by third parties and then made publically available, however, proactive engagement was not performed to enhance corporate transparency. Stakeholder analysis is not performed periodically in one of the corporate cases.

CHAPTER 6. CONCLUSTIONS AND DIRECTIONS FOR FURTHER STUDY

6.1 Introduction

This dissertation author has searched for the key factors of corporate sustainability management (CSM) based on its definition developed in (*Research Question 1: What factors are generally considered for strategic corporate sustainability in Korean business circles?*), and performed empirical studies within three Korean companies. His objective was to obtain insights into whether the corporate sustainability strategies in these three Korean companies for sustainable competitive advantage are consistent with the sustainability SWOT analysis (*Research Question 2: Is the direction of corporate sustainability strategy in Korean companies appropriate for sustainable growth of the companies?*). The second objective was to analyze whether business activities of the three Korean companies actually contribute to their value in sustainability perspectives (*Research Question 3: Why have Korean companies tried to integrate sustainability into corporate strategy?*).

To seek answers to these three Research Questions in the dissertation, it considered internalization of externalities as a theoretical driver and business management theories were integrated as a theoretical perspective for responses to the need to internalize the externalities. That is to say, a resource-based and a dynamic compatibilities view, social investment and bottom of the economic pyramid view based on industry organizational model, and Plan-Do-Check-Act Model were provided as theoretical perspectives for enhancement of corporate value in terms of sustainability (see Figures 2.5 and 2.6).

On the basis of theoretical perspective, the dissertation conducted literature review in order to define CSM concept and search for key factors of CSM. Through the literature review, the dissertation author was aware that five terminologies (hereafter, five pillars) should be understood for defining CSM and its core indicators (see section 4.2), and to search for driving forces for each indicator (see section 4.3). Therefore, the dissertation inquired into the concept and meaning of five pillars for CSM such as sustainable development, environmental management, corporate social responsibility, stakeholder engagement, and corporate accountability (*Research Question 1*). In addition, it ultimately provides the basis of 'Corporate Value Matrix for Sustainability (CVMS)' for the empirical studies of the dissertation (see figure 4.6 in section 4.4) and checklist (see figure 4.7 and appendix B). And in Chapter 5, the dissertation author performed an empirical studies and presented the results of the case studies on the basis of the CVMS formulated in the Chapter 4 and CSM checklists on CVMS basis (*Research Question 2, 3*).

This chapter includes conclusions of this dissertation based on the analysis from chapter 2 to chapter 5. The author summarizes the contents and discusses the findings and results drawn from insights into the definition, three indicators and core driving forces of each indicator of Corporate Sustainability

Management (Chapter 4) and the empirical study (Chapter 5) performed on CVMS model and CSM checklists basis in the following section. Limitations of the dissertation are presented in Section 6.3 and additional research directions and an agenda of topics is proposed to be explored in the future.

6.2 Summary and Discussion of Research Findings and Results

6.2.1 Summary of the dissertation

The dissertation author defined the concept of corporate sustainability management as a new paradigm for the field of strategic management based on examining five pillars for CSM such as sustainable development, environmental management, corporate social responsibility, stakeholder engagement, and corporate accountability. In addition, he presented a 'corporate value matrix for sustainability' and CSM checklists for empirical study in the dissertation (*Research Question1*). The dissertation author performed an empirical case study based on the CVMS model and CSM checklists. That is to say, he analyzed activities of three Korean companies in accordance with sustainability opportunities and threat analysis. The author particularly evaluated activities of a Korean steel firm based upon surveys of the firm's employees' and upon an evaluation or recognition by international organization in sustainability perspectives (*Research Question 2*), and, ultimately, he strived to measure the impacts of sustainability activities of three companies on their corporate value as a type of 'sustainability possibility frontier curve(*Research Question 3*).'

To sum up, literature review for developing an insight into Corporate Sustainability Management (CSM) concepts and practices have contributed to the development of the field of strategic sustainability management, and empirical study has been helpful to enhance understanding regarding core determinants, in particular sustainability factors in Korean business circles. In addition, this trial can be the constituency for generalization of CSM concepts and its determinants, and the applied model in the dissertation. The detail each chapter is as follows;

In Chapter 1, the author presented the background of corporate sustainability management and underscored the importance of non-business aspects such as corporate governance, stakeholder engagement, cleaner production, human rights, and socio-economy in strategic management decision-making processes.

Then the dissertation author presented three points as background for corporate CSM. The first point is that a 'the emergence of sustainability philosophy' is being emerged as a new paradigm for human being. The second is that the TBL is new criterion for firm competitiveness, so called 'sustainable competitive advantage' is being applied. And the third is that TBL criteria are to be a global market rule for business. In the line with the need of the market, many researchers in the field of strategic management have strived to integrate TBL into decision-making process focused on traditionally

financial perspective as they have taken efforts to prove that this is supposed to enhance corporate value in the long-term.

Considering these three points, motivations of dissertation author were presented in section 1.2. The global CSM practices were compared with the realities of three large Korean businesses. Three research questions were developed to guide the research and dissertation development.

- ***RQ 1****: What factors are generally considered for strategic corporate sustainability in Korean business circles?*
- ***RQ 2****: Is the direction of corporate sustainability strategy in Korean companies appropriate for sustainable growth of the companies?*
- ***RQ 3****: Why have Korean companies tried to integrate sustainability into corporate strategy?*

Chapter 2 of this dissertation examines the theoretical background for CSM from business management perspectives, together with the theory of internalization of externalities as a driver for CSM, on the premise that CSM is a new management paradigm for achieving sustainable competitive advantage. The industrial organizational (IO) model (Porter, 1980, 1985) and resource based (RB) model (Barney, 1991; Wernerfelt, 1984; Teece et al., 1997) were examined for corporate sustainability management in business management. The internationalization of externalities as a driver for CSM provided the rational foundation for industry to consider CSM in strategic management. That is to say, the industrial organizational model and resource based model were used as theoretical bases for sustainable competitive advantage of the firm.

Integration of both the IO and RB can be a fresh perspective in the strategic management field. Both perspectives have mainly stood on their own in the field of strategic management yet. However, the dissertation author felt confident as a result of the examination that integration of both perspectives is crucial for achieving sustainable competitive advantage. Furthermore, the author of this dissertation argues that the PDCA model (Deming, 1970s; Shewhart, 1930s) should be linked with these theories in order to ensure systematically embedded and thus efficient framework of corporate strategic management.

This is one of several academic contributions of this dissertation. Additionally, through a literature review, this dissertation confirmed that academics have a great interest in the relationship between financial performance and non-financial performance. It is also the interests that the business circles have.

Generally, three methods have been applied as follows; the first is collection of evidence on BCS and broad recommendations for actions, the second is ‘coaching’ tools that serve as a detailed roadmap for managers on how to build their BCS, and the third is valuation tools that are designed to quantify the

BCS(see table 2.4~2.6). Due to data availability, this dissertation author adopted the first method titled as, “collection of evidence on the BCS.”

Chapter 3 analyzed ‘state of the art,’ of Korea and in its industry in TBL perspective together with various efforts of the Korean government to make progress towards sustainable industry. In addition, activities of the three Korean companies were analyzed, using the ‘plan-do-check-act’ framework with the activities of globally leading companies in the same industrial sectors.

The general sustainability situation in Korea was described mainly on the basis of indicators regarding the sustainability of Korea evaluated by international organizations such as WEF, IUCN, and IDRC. In addition, a sustainability evaluation of the Korean industry was performed on the basis of indicators for sustainable industry developed by B.W. Lee and G.C. Kim (2000). As a result of this analysis, the economic and social development of Korea, which have mainly focused on economic growth, value-added rate, ordinary margin, profitability, and employment etc by sector, was found to have improved to a certain extent from 1980 to 2000 (see table 3.6~3.10).

However, during this same time-frame Korean eco-systems have been heavily damaged and are confronted with great pressures from socio-economic growth. One of the reasons for this is due to the structure and type of industrial activity. That is, in spite of limited natural resources, consumption of natural resources by Korean businesses has continuously increased, even though the growth rate slowed down in the late 1990s. Particularly, high growth in energy intensive manufacturing resulted in the increases of energy consumption in the 1990s, and consequently there have been serious increases in environmental pollution in Korea.

The recent slow down of growth, especially since 2002, high rate of unemployment, and an aging population is all important societal challenges for Korea. Accordingly, various policies and measures focusing on harmonizing the environment with the economy have been developed and are being implemented by Korean central governmental departments such as PCSD, MOCIE, MOE, and by local governments. These regulatory and policy pressures are now being applied upon the Korean business circles.

At the same time, together with pressure from international society, various domestic policies on sustainable industry have had a great influence on a few big Korean companies. These companies are now striving to integrate environmental or sustainable thinking into their strategic management policies, strategies and activities.

Accordingly in this chapter, sustainability state of the art of three Korean companies, which have made a great contribution to the continuous growth of Korea were analyzed. At the same time, the comparability with globally leading companies in the same industrial sector was performed. The international companies used as the basis for comparison included: Philips, Arcelor, and Toyota. Insights

gained from this comparison helped the author to better understand the reality of Korean company's sustainability. The Plan-Do-Check-Act model (Deming, 1970s; Shewhart, 1930s) was used to perform the analysis of the 'state of the art,' of sustainable management in the Korean companies. The findings include:

① Korean companies' sustainability orientations and actions for sustainability management have been heavily influenced by international organizations and by government policies, because they can be new criteria for sustainable competitive advantage (see chapter 1). In this respect, global leading companies share similar pressures as those experienced by Korean companies. In particular, companies in the electronics and automobile sectors, which produce final consumer goods, have been impacted by similar regulations. Recently, a series of environmental laws focusing on the ban of products containing hazardous substances are having extensive impacts. Furthermore the global expansion of corporate social responsibility (CSR) focusing on considerations of a wide range of stakeholders including customers, the community, and the natural environment have become a chief priority to ensure global corporate competitivity.

② According to industrial sectoral characteristics (such as the process, product, core customer etc.), the direction of the sustainable management is slightly different in the three Korean case study companies. The companies of the electronics and automobile sectors, which produce final consumer goods, have developed an increased interest in products and related technologies in the value chain perspectives, and in customer and employees in the stakeholder perspectives for their improved competitivity and sustainability. However, the steel industry which produces intermediate goods for subsequent manufacturers has developed an increased interest in making improvements in energy intensive processes and related technologies. The steel industry also increased its responsiveness to diverse members of the community including NGOs and employees from a more comprehensive stakeholder perspective.

③ Using the PDCA model as a framework for comparison, Korean companies and globally leading companies both nominally and virtually have a similar management philosophy including a CEO message in the plan stage, conducting proactive activities via the HRM department for increasing awareness and R&D activities for coping with new challenges in the Do stage, acquiring a certificate and assurance regarding data and activities of their sustainable management in the Check stage, and having a management review regarding sustainability issues in the Act stage. However, the following differences between Korean companies and globally leading companies were found:

(4) In the ***Plan*** stage, the importance of stakeholder analysis, the business principles including a wide range of international standards, law and regulations in sustainability perspectives, business ethics or codes of conduct as a basic compliance for business activity, and objectives and measures systematically based on the management philosophy were identified more clearly

and accurately in the globally leading companies than in Korean companies.

(5) In the ***Do*** stage, organizational charts of global companies for sustainability management were more comprehensive and systematic than those of Korean companies. In value chain perspectives, the sustainability concept in the case of global leading companies was well embedded in their core functions such as R&D, Purchasing, Manufacturing, and Marketing compared with those of Korean companies. The main reason seems to be due to the experience of industrialization and the scope of the market. To correct this difference, first of all, Korean firms should redesign the role and responsibility of key functions of their sustainability emphases on the basis of SWOT, and ultimately, their sustainability emphases should be integrated into all decision making processes. This will enhance the position of the Korean companies up to the global standard and help them achieve sustainable competitive advantages.

(6) In the framework of strategic management perspectives, the strategic structure of the global leading companies for sustainable management is more clearly and accurately developed than that of Korean companies. That is to say, the role of business ethics and codes of conduct for ethical management are currently very ambiguous in the framework of strategic management in Korean companies. This is the case so especially for the business or sustainability principles, which include a wide range of requirements for sustainability management such as international conventions, international and domestic laws, business ethics etc. that should be integrated as basic elements for implementation of their corporate sustainability strategies. In the PDCA framework, stakeholder analyses should be carried out to establish their strategic objectives in sustainability.

According to the change in business circumstances and various industrial policies by the Korean the government, the leading Korean companies have worked to introduce a new sustainability management paradigm and to integrate it into their decision making process. However, the state of the art of leading Korean companies is still in the infant stages in comparison with that of global leaders in PDCA perspective (see Table 3.18~3.23). In particular, the Plan and Do stages in PDCA should be improved in order to carry out a strategic management framework systematically and to enhance their corporate value. The author of this dissertation believes that it would not be easy to embed new business approaches into the framework of the existing strategic management within 2 years since sustainability management was introduced. Furthermore, without any improvement in Plan and Do stage, the integration of sustainability into the existing strategic management is not likely to happen any time soon.

In Chapter 4, this dissertation author examined the concepts of corporate sustainability management based on the analysis of the concept of the five pillars for CSM that include sustainability, environmental management, corporate social responsibility, stakeholder management, and corporate accountability. These elements were analyzed as driving forces for implementation of CSM and as key

CSM evaluation criteria used by influential rating institutes. Through these analyses, the author defined corporate sustainability management and derived its core driving forces for corporate sustainability management. These factors are based on the Corporate Value Matrix for Sustainability (CVMS) model which is composed of business success factors and non-business success factors. It is a tool to measure the degree of relationship between business and non-business factors; it is mainly based on collected evidence and broad recommendations for firms' actions. The CSM defined and CVMS model established in Chapter 4 can be provided as tools for answering '***Research Question 1.***' At the same time, three indicators and core driving forces of each indicator on the basis of CSM definitions provide the groundwork for corporate sustainability management. To help to ensure sustainable competitive advantage, strategic sustainability management should be implemented systematically. Thus, the author presents a strategic CSM framework linked with Plan-Do-Check-Act cycle (see figure 4.8) in order to improve corporate value measured based on "Corporate Value Matrix for Sustainability (CVMS)," which is established on the basis of CSM definition. Figure 4.8 reflects the framework of strategic sustainability management. A strategic framework of CSM should be consistent, well constructed, and utilized on an on-going basis. That is to say, management philosophy embracing sustainable development concept will be realized through the systematic implementation of strategy in accordance with TBL concept, and an outcome of TBL activities should be measured, evaluated and verified on an objective baseline, and engaged proactively with the key stakeholders. In addition, the strategy should be implemented based on the business principle including international organizational guideline and agreement, law and regulation, and business ethics etc. Finally, a firm should maintain the relationships, e.g. a partnership or engagement with stakeholders who are related to its operations. Such an activity will be on the basis of corporate accountability or transparency.

In Chapter 5, the author of this dissertation provides the results of an empirical study regarding ***Research Questions 2 and 3***. The objectives of the empirical study were twofold: a) to acquire evidence about the sustainability strategies of Korean firms and to ascertain whether they are appropriate for helping the firms achieve sustainable competitive advantage in social investment; b) to obtain evidence regarding the change of the sustainability frontier curve in Korean companies as a representative of corporate sustainability values.

In order to accomplish these objectives, empirical studies were carried out in three Korean companies (electronics, automobile and steel industry), that are considered leaders in implementation of sustainability management in Korea, on the basis of the CVMS model (see Chapter 4). As further empirical study was performed to search for insight about how firm's resources are allocated to improve the Korean steel company's strategic management. The author developed and used an in-depth checklist based on the definition and driving forces of CSM in value chain and PDCA cycle perspectives. Evidence was found that helped the author to address ***Research Question 2;*** the evidence was derived

by comparing results of external sustainability analysis with real activities of three Korean companies (industrial organization perspectives of Porter, 2002, 1996, 1985) and by comparing internal sustainability analyses with the evaluation results of international rating institutes such as SAM DJSI (resources based view of Wernerfelt, 1984 and Barney, 1991). Evidence to answer ***Research Question 3*** was obtained by performing gap analyses between a sustainability frontier curve or (conceptual) corporate value of 2002 and that of 2004.

Chapter 6 summarizes and discusses research findings and results. Particularly, it explains the limitations of the dissertation and provides possible directions for further study in order to enhance corporate value by sustainability management..

6.2.2 Discussion of Research Findings and Results

This section provides findings and results related to ***Research Questions* 1, 2, 3** obtained during the dissertation research activities.

[***Research Question 1***]

For the results to ***Research Question 1*** (*What factors are generally considered desirable for strategic corporate sustainability?*), a wide range of literature was reviewed. In the course of the analysis, corporate sustainability management was found to help the organizations pursue long-term profits so that the firm satisfies the needs of various stakeholders considering the definition of sustainability, the purposes of the firm, and the concepts of strategic management (see Table 4.2 in Chapter 4).

The findings are somewhat different from and sometimes, the opposite from Friedman's position. The Friedman view is that "the only responsibility of business towards society is the maximization of profits to the shareholders within the legal framework and the ethical custom of the country (1970). " Burke and Lodgson (1996) also pointed out that corporate philanthropic activities themselves, having been emphasized recently in CSM, must be closer to the firm's mission for sustainable competitive advantage if they are to be truly beneficial for the sustainability of the firm. The reason is that the firm has the knowledge and resources for a better understanding of how to solve some problems related to its mission (Porter and Kramer, 2002). Strongly supporting Burke and Lodgson (1996) and Porter and Kramer (2002), the author would like to argue that it should be properly linked that philanthropic activities in the company's strategic sustainability management must be based on its mission, short- and long term strategy, business activities including process and product characteristics, etc.

Therefore, the dissertation author reaches the following conclusions: a) the theories for CSM should be appropriate for supporting corporate utilization of the IO model for strategic positioning according to the approach of Porter (1985, 1980); b) the RB model focusing on the enhancement of resource capability (Barney, 1991) in business management perspectives, on the basis of internalization of

externalities in economic perspectives such as a Pigouvian tax and the Coase Theorem as a driver for CSM should be factored into the company's CSM.

Therefore, when corporate managers adopt CSM as an alternative concept to the traditional growth and short-term profit-maximization model, they should consider this kind of theoretical background of CSM. Together with the theoretical perspectives of the dissertation, CSM may be based on the five pillars (see Table 4.2 and 4.3; Figure 4.2):

a) Sustainable development/sustainability;
b) Environmental management;
c) Corporate social responsibility;
d) Stakeholder engagement;
e) Corporate accountability.

These five pillars of CSM were examined on the basis of discussions of researchers in the historical perspective (see chapter 4). In the course of the analyses of five terminologies, the dissertation author found that corporate social responsibility (including corporate citizenship and business ethics) and stakeholder engagement which addresses the relationship between the firm and the society are more important than ever, and that the width and range to understand the five terminologies are very different in accordance with the perspective about the purpose of a firm. In addition, the definitions of some terminologies such as corporate social responsibility and corporate citizenship are very ambiguous and still on evolving concept. This can lead to confusion and misunderstanding regarding the purpose of a firm, and create unnecessary difficulty in any engagement or relationship with stakeholders, particularly, with NGOs related labor and environment, and finally, financial performance of a firm may be worse due to deterioration of image or distortion of resources. In addition, there are various approaches which are mainly separated into descriptive/instrumental approaches and normative approaches focusing on business ethics. Therefore, prior to define CSM concept, the dissertation author think that it is more crucial point to establish point of view about the purpose of a firm.

Hence, the dissertation author confirms that CSM is beneficial for supporting the strategic management of the firm and sustainable competitive advantage; that is to say, it coincides with the results obtained based upon the concept of sustainable development, the purpose of the firm, and the concept of management and the relationship with strategic management. In addition, this dissertation author thinks that the strategy for corporate sustainability management is "a set of integrated actions or capabilities of firms to achieve sustainable corporate competitive advantages by utilizing a value-creating and –capturing strategy that cannot be (easily) duplicated," based on the theoretical perspectives of this dissertation (see Chapter 2). Therefore, when integrating CSM into a firm's strategic management, *the contractual obligation to stakeholders* based on capital based approach which its point of view must be considered should be advisable for the definition of CSM. Thus, the concept of CSM in the

dissertation was defined as a capital-based approach based on comparability and analysis of these five terminologies with the consistency of the theoretical perspectives of the dissertation (see the Chapter 2) is as follows;

> ***A corporate management strategy that helps to ensure that the company pursues continual improvement or increase of "return on investment" of economic capital, natural or environmental capital, and social capital as measured and evaluated systematically throughout the whole business management life, without compromising the firm's ability to meet the needs of the present and future (direct and indirect) or stakeholders (such as shareholders, employees, clients, pressure groups, communities etc), in such a way that it seeks to go beyond compliance.***

This dissertation author examined the literature of researchers and consultants (Barney, 1991; Grant, 1991; Hart, 1995; Teece, Russo and Fouts, 1997; Carroll, 1999; Sustainability, 2001; T. Dyllick and K.Hockerts, 2002, Thorpe and Prakash-Mani, 2003), and analyzed the evaluation criteria of the main rating institutes including the GRI (See Table 4.13 in section 4.4.2 and appendix) in order to gain an understanding of the driving forces for companies to move in the direction of CSM.

Finally, the dissertation author developed and utilized a 'corporate value matrix for sustainability (CVMS).' It is useful for illustrating the change of corporate values due to consideration of non-financial factors. The data are not sufficient to confirm the change of corporate value on the basis of the linkage between financial and non-financial factors, because Korean industry is now in its infant stages in CSM. The model was evaluated according to the criteria proposed in Chapter 2, and the results provided in Chapter 5 as a type of 'sustainability possibility frontier curve. '

The dissertation presents a strategic framework of corporate sustainability management based on the definition of CSM and to the terms related to it (see figure 4.6 or 6.1). It argues that the management philosophy including sustainability should be linked with three capitals – economical, natural, and social. Further business or management principles should be established as a basic guideline of business activities. The firms should pursue strategic options of each capital systematically aiming to proceed beyond compliance based on a management philosophy and objectives of simultaneously achieving sustainable management of the three capitals. And, business or sustainability principles, which include various requirements for sustainability management such as international conventions, external and internal laws, and business ethics, should be integrated as basic elements for implementation of sustainability strategies. In the meanwhile, the results or performance of the firm's sustainable activities should be measured as a type of eco-efficiency and socio-efficiency and be verified and assured by an independent and publicly trusted third-party. In addition, a company pursuing sustainability management should have close relationships with stakeholders who are related to its operations via proactive engagement and partnerships.

Figure 6.1 Corporate Value Matrix for Sustainability

Non-Business Sector / Business Sector		Economic Capital							Natural Capital			Social Capital		
		Governance & Management	Information of Profit Flow	Stakeholders engagement					Pollution Prevention	Environmental Friendly Product	Environmental Awareness	Human Resource Management	Labor Practice/ Human Right	Socio-Economic Development
				a	b	c	d	e						
Economic Capital	Revenue Growth													
	Cost savings													
	License to Operate													
	Access to capital													
	Risk Management													
	Reputation/ Brand Value													

Note: a = Provider of Capital including shareholder, b = Suppliers, c = employees including external suppliers, d = customers, e = local communities including NGOs, and others

To conclude, various terminologies for achieving sustainable competitive advantage such as environmental management, corporate social responsibility, corporate citizenship, and corporate sustainability have been developed. Just as, sustainable development was defined on the basis of integration of economy, society, and environment by Gladwin et al. (1995) and WBCSD (2000). Particularly, the definition of sustainable development based on three basic principles (see section 4.2.2 in Chapter 4), perspectives regarding the purpose of corporations, and an understanding of the concept of strategic management makes achieving sustainable development more clear and accurate. That is, corporate sustainability management is the most suitable for a firm and should be defined based on a capital-based approach focusing on stakeholders including shareholders. In this regard, the key capitals and their driving forces were identified on the basis of the analysis regarding arguments of some researchers and upon the criteria of rating institutes including GRI and a model for the case study. Additionally, the author of this dissertation presents a framework for strategic sustainability management (see Figure 4.8). The performance (or corporate value) measured by 'Corporate Value Matrix for Sustainability (CVMS),' established by corporate sustainability management definition, and its indicators and driving forces can be improved, in case that CSM should be implemented synthetically

and systematically. Figure 4.8 can be a strategic CSM framework example for the systematic implementation. These are solutions to ***Research Question 1***.

However, not all companies currently subscribe to the term CSM for sustainable development, and it is unlikely that all will, at least not voluntarily. But, by taking account of the concepts and definitions of the five pillars for CSM, this dissertation suggests that in strategic management perspectives it would be better for the firm to do so in order to be sustainable in the long run. Actually, a significant number of companies have made public commitments to environmental protection, social justice and equity, and economic development. And the number of companies joining is increasing. This trend will be reinforced if shareholders and other stakeholders support and reward companies that conduct their operations in a sustainable way.

[***Research Question 2***]

For the results of ***Research Question 2*** (*Is the direction of corporate sustainability strategy in Korean companies appropriate for them to achieve sustainable competitive advantage?*), empirical studies were carried out within three Korean companies (one company among the electronics, automobile and steel industry respectively) base upon use of the CVMS model (see Chapter 4). These companies are leading in the implementation of CSM in Korea. In addition, upon further empirical studies to search for a firm's resources to be improved was performed within a Korean steel company through an in-depth checklist made based on the definition and driving forces of CSM (see chapter 4).

Evidence of ***Research Question 2*** was obtained by comparing results of external sustainability analyses with the real activities of the three Korean companies (industrial organization perspectives of Porter, 2002, 1996, 1985) and by comparing the internal sustainability analyses with the evaluation results of international rating institutes such as SAM DJSI (resources based view of Wernerfelt, 1984 and Barney, 1991). The findings are:

① Strategic activities of a Korean electronic company (Samsung SDI) are suitable for maximization of its opportunities and for neutralization of its threats based on the external sustainability analyses. In particular, R&D activities in stakeholder engagement of economic capital, pollution prevention, and environmentally friendly product activities pertaining to natural capital were found to be the best preference based on the external sustainability analysis of the electronic industry. They are contributing to achieving sustainable competitive advantages in the global market. The company's strategic framework for sustainability management has been revised to integrate its management principles with its management philosophy and strategic options. The author of this dissertation argues that company's management & business principles must consider a wide range of principles and standards, stakeholders and their needs/opinions (See Chapter 4).

② However, many activities must be intensified continuously in order for the company to achieve

sustainable growth. And, some activities for enhancing economic capital must be revised. First, the company must conduct communication with stakeholder or stakeholder dialogue regularly, then its sustainable strategic options should be developed and implemented based on accurate identification of stakeholders and their needs. Stakeholder dialogue, if properly performed, can greatly enhance transparency and responsiveness of corporation. Then, information about and principles of profit should be presented to all stakeholders in a transparent manner. Finally, verification of the sustainability reports must be improved. An internationally respected third party should be hired to conduct the verification on company's CSM program and reports, and should issue a letter of assurance. That will further help the company to improve its global competitivity. In addition, social activities that can directly improve its value should be continuously strengthened along with many activities.

③ Continuous R&D activities of a Korean automobile company (Hyundai Motor) are becoming very active, including their efforts on hybrid and fuel cell cars that are designed to help them improve their external sustainability challenges such as rigorous domestic and overseas standards regarding fuel efficiency, pollutant emissions, and utilization of hazardous substances. As a global leading car manufacturer, it spent tremendous efforts on verification and assurance activities with highly recognized international third parties. However, considering the environmental characteristics of automobiles which consume fossil fuels and emit pollutants on a large scale, environmental awareness activities of natural capital and development of social capital must be linked with continuous effort. Recently, a wide range of social economic development activities such as voluntary recall, 24-hour emergency vehicle rescue, children traffic safety campaign, free check for disable people, islands area, and donation of ambulances to Africa, were implemented. However, these activities did not consider the importance of energy and environmental issues, which are considered as major priorities in the sustainability of the Korean automobile industry according to external sustainability analyses. Additionally, R&D activities for improvement of energy and environmental issues should be focused upon cost reductions to achieve sustainable competitive advantage. At the same time, its stakeholder analysis carried out in 2003 for continuously enhancing economic capital must be conducted regularly to continue to identify stakeholder's needs and to respond to them. The framework of CSM must also be made more systematic. However, the company's ethical management did not place adequate emphasis upon its strategic sustainability framework. Because of that, its management philosophy and its purposes are ambiguous.

④ Based upon the results of external sustainability analyses of the Korean steel industry, POSCO's stabilized and economically sound procurement of raw materials through contracts with mining companies such as CVRD, BHP, Canada Mining Company, and its joint ventures with mining companies have helped improve their economic capital. Additionally due to and its continuous R&D activity and

performance on implementing energy efficient and environmental friendly processes such as FINEX, strip casting in natural capital, greatly contribute to its sustainable competitive advantage through maximization of its opportunities and neutralization of its threats.

Corporate governance, information of profit flows and 'verification and assurance' activities implemented by internationally trusted third parties have improved its transparency and objectiveness. However, in order to efficiently and continuously engage its stakeholder and to promote transparency, the firm must perform stakeholder analyses regularly so that accurate and regular identification of its stakeholder's needs is maintained in an updated form. Environmental awareness activities should be intensified together with enhanced emphasis upon the importance of natural resources. The framework of the company's CSM in 2004 was found to be more systematic, in comparison with what it was in 2002. The function or role of its business ethics or code of conduct should be more appropriately defined within its strategic framework for CSM in order to enhance the clearness of strategic framework for CSM (see Figure 4.6). Meantime, the company's social activities were not sufficient, particularly, as global leading company in steel industry. A wide range of social activities which reflect the characteristics of its business and location should be intensified and developed to advance from indirect factors such as reputation to direct factors such as cost savings and revenue growth, and to be performed globally where its sites have been operated.

⑤ Together with strategic adoption of the TBL approach to enhance the firm's resource capability, this dissertation administers a survey to employees of a Korean steel company regarding strengths and weaknesses in sustainability perspective (see 5.3.2). According to the view of evaluators, the same activities can be evaluated differently. Typical examples in the case of the Korean steel company are the result of evaluation for activities related to FINEX, stakeholder engagement, and human resource management. SAM DJSI had a great opinion of three activities such as FINEX, stakeholder engagement, and human resource management, but its employees did not rate as very high, respectively. Through the survey, the author of this dissertation is aware that view of its employees regarding its sustainability activities comparing with the view of SAM DJSI might be different, and that interpretation or analysis of information is important to make a decision on strategic options for enhancing sustainable competitive advantage. Therefore, strategic directions and options must be selected based upon the premise of identification and opinion of core stakeholders, and upon elaborated analysis about internal resource capability.

To conclude, the CSM of the three Korean companies studied for this dissertation, on the whole, are consistent with their external sustainability analyses for helping them achieve sustainable competitive advantages. However, some activities such as activities related to governance, information of profit flow, stakeholder engagement based on stakeholder analysis, environmental awareness, and human resource management must be revised or improved considering the results of the external sustainability analyses.

Other facets of their CSM must be intensified considering the characteristics of each industry. The views of employees and international rating institutes were also helpful for the corporate management to decide directions for future, on-going improvement.

[***Research Question 3***]

In order to obtain answers for ***Research Question 3*** (*Are business activities of the case study companies, as a result, actually contributing to improving their value from a sustainability perspective?*), empirical studies were performed based on the CVMS model. Evidence of needs for improvement was obtained by performance gap analysis between the sustainability frontier curve and (conceptual) corporate values for the companies based upon data from 2002 and 2004.

- ***Research Question 3*** concerns the reasons why Korean companies are working to integrate sustainability into their strategic management. This author hypothesized that improvements in CSM may be helpful to enhance sustainable competitive advantage and corporate value in the long-term. In the dissertation, sustainable competitive advantage and corporate value were measured as a 'sustainability possibility frontier curve' which reflects the level of the relationship among the triple bottom lines, namely economic, natural, and social capital in non-business sectors, and traditional economic capital in business sectors. CVMS analysis results were presented in Chapter 4. The criteria for evaluation were explained in Chapter 2.
- In the dissertation, the sustainability possibility frontier curve of the three Korean companies in 2002 and 2004 were depicted for comparability. It was confirmed that all the sustainability possibility frontier curves of the three companies have been improved. However, their interactions with their natural capital have not yet made progress. Rather, that of the Korean electronic company was decreased its natural capital interaction score.
- However, this dissertation author does not draw the conclusion that this company has not taken efforts to improve environmental performance. Rather, he would like to suggest that a diversity of factors such analysis period, research approach, environmental R&D characteristics should be taken consideration, when researchers for future study related to this dissertation provides the insight.

To conclude, sustainability management of the three Korean companies considers strategic options in order to attain sustainable competitive advantage, based on the external sustainability analyses of each company. However, some activities of three Korean companies did not help improve sustainable competitive advantage, based on the analysis criteria applied in this dissertation (see Chapter 2 and 5). These strategic options should be continuously improved, mainly considering the characteristics of each industry for sustainable competitive advantage. In addition, the views of employees and international rating institutes should help corporate leadership decide and enhance internal resource comparability with strategic directions for sustainable competitive advantage.

This dissertation author confirmed that sustainability management for a firm is a new management paradigm for long-term corporate value, and CVMS model with relevant criteria based on CSM concept can be helpful to decide strategic options for sustainable competitive advantage.

6.3 General Conclusions: Limitation of this research and suggested directions for future study

This dissertation author obtained and presented evidences to answer the research questions pertaining to the emerging elements in CSM from a global and a Korean perspective.

Table 6.1 Findings related to research questions in the dissertation

	Findings		Remarks
	Core	Additional	
RQ1	·Defined CSM and three indicators ·Derived driving forces for each indicator based on each indicator for CS and analysis of evaluation criteria of key international rating institutes; ·Established CVMS model for empirical study	·Great interest in the relationship between financial performance and non-financial performance in academic circles. Especially, the business case study is one of the main applied methods; factors that are not included are natural and social cases due to the difficulty of conceptual definition and lack of data; ·Theoretical perspectives: integrating social investment based on IO and RB theories, and linkage with the PDCA model; ·Evaluation Criteria for activities: Matrix for valuable and non-substitutable activity; ·Strategic Framework for corporate sustainability management.	·Literature review
RQ2	·Confirm strategic direction and factors to be improved in three Korean global firms from a sustainability perspective, taking sustainability SWOT analyses into consideration. ·Generally, the direction of sustainability management is consistent with business atmosphere and requirement of international rating institute in sustainability perspectives; however, its intensity should be improved for enhancing corporate value.	·Sustainability management of three Korean companies, leader in Korea, is generally in the infant stage from a CSM perspective, compared with global companies based upon the PDCC analytical framework.	·Empirical Study
RQ3	·Generally, the sustainability possibility frontier curves of the three Korean case study companies have been during the period between 2002 and 2004..	·The sustainability possibility frontier curve is not easy to measure in the short term. Especially, environmental performance is very difficult to evaluate due to the complexity of the factors that must be assessed.	Empirical Study

Considering that Korean industries have benefited from long histories of operating sustainably several findings were confirmed including answers to the three research questions. Table 6.1 summarizes the main findings in the dissertation based on the analyses from Chapter 1 to Chapter 5.

While this dissertation author has learned much in the process of the planning and development of this work, he also acknowledges limitations in the scope and in the findings. The following are limitations that should be addressed in future research:

The study suffered, first of all, from a contextual limitation inherent to the limited diffusion of data including information such as the objectives and scope of the company activities; this is due to the corporate culture of the Korean industry. The three Korean companies, studied in this research, produce sustainability reports on a regular basis. However, most information contained in their reports tends to be reported in a positive manner. To make up for these weak points, the author performed field studies through visiting the three companies and performed an intensive search for related journal articles provided by the Korean stock market.

The firms' representatives always provided positive feedback on the questions posed by this author, however their answers and the articles were not enough to adequately and fully identify, understand, and analyze the background of the company's CSM activities. Another reason of insufficiency of the context and data is related to the relatively short history of sustainability management in the Korean industry. It has only been 2 or 3 years since Korean companies integrated sustainability concepts in strategic management. Therefore, exploratory research using literature reviews and case studies including the survey as a research strategy was highly useful and helpful methodology under these conditions.

The next set of weaknesses inherent to this dissertation is related to the literature review and case studies. First, the dissertation author used a literature review to define CSM and to make a model for the empirical study. The author reviewed a wide range of literature related to the definitions of CSM, particularly for understanding the five pillars or terminologies related to CSM. The scope related to the CSM definition is too wide and complex; therefore, it was not easy to apply for the purposes of the dissertation. Thus, the CSM definition and the CVMS model of the dissertation may be biased due to insufficient review and analysis. Second, caution is necessary in interpreting the findings of the case studies. Yin (2003) argued that the analysis of case study evidence is one of the least developed and most difficult aspects of doing case studies, and, in fact, unlike statistical analysis, there are few fixed formula or cookbook recipes to guide the novice. Therefore, much depends on an investigator's own style of rigorous thinking, along with proper presentation of the evidence and careful consideration of alternative interpretations.

Thus, the author of this dissertation established the criteria prior to performance of the case studies (See the Chapter 2). This was done by reviewing the literature related to the topic of the dissertation and

discussing the ideas related to the dissertation with many colleagues in academia and industry. The case study analyses were performed based upon a logistical model, which is a combination of pattern-matching and time-series analysis. The analyses were designed to understand the inherent patterns according to the criteria. The analyses deal with the sustainability activities of the three Korean companies for the period for the years of 2002 and 2004. In spite of these kinds of efforts, the empirical studies of the three Korean companies are obviously subjective due to some of the ambiguous evaluation criteria and the perceptual biases that may have resulted in the interpretation of the individual firm's activities. Although this author is convinced that the case materials do support the interpretations he has made, there is always the possibility that another set of researchers may have reached different conclusions with the same data. It can be argued that field-based research cannot be divorced from the biases of the researchers, particularly in the presence of an intrusive research approach typical of any clinical field research (Perego, 2005). Thirdly, the case design could be criticized for the selection of companies that evidenced idiosyncrasies that supported the theoretical model. The three Korean companies selected for the study are working to integrate sustainability into their traditional strategic management within the context of Korean industry since 2002; as a result, two companies among them were included in the universe of SAM DJSI in 2005. However, Korean companies which announced proactively to pursue CSM were these three, and this dissertation focuses on why Korean companies have only recently integrated sustainability into their strategic management. Therefore the author of the dissertation chose the three companies. Fourth, the results of the dissertation were based upon inputs only from three Korean companies. Consequently, one must be cautious about generalizing the results to a broader array of companies, even others in the same three industrial sectors as these.

The results and limitations of this research point to several directions for further, theory-driven research around the topic of the use of CSM.

First, the priority issue for the objectiveness of the research must be evaluated more concretely based upon the criteria defined in figure 2.7 of chapter 2, which were used for the evaluation of the firm's activities. The evaluation criteria were based upon the requirements for sustainable competitive advantage according to Barney (1991). Figure 2.7 indicates the criteria used in this dissertation. Although the conceptual definition of each segment was clear, evaluation of each activity performed by each firm was not easy. The reasons include:

- All the sustainability activities of the companies have a relative value and some uncertain factors. Furthermore, it is not easy to establish a preference for segment ② and segment ③ in strategic sustainability management perspective.
- Segment ② means that there is a high value placed upon valuable activities and a low value placed upon non-substitutable activities.

- Segment ③ means that there is a low level or ambiguity level in valuable activities and high level in non-substitutable activities from a strategic management perspective.

However, this dissertation author placed much more importance on segment ③ than on segment ②, even though all the activities related to segment ③ have an uncertainty on sustainable competitive advantage or corporate value, considering that CSM is defined as a "pursuance of continual improvement or an increase of "return on investment" of economic, natural or environmental, social capital (See Chapter 4)." However, as the case may be, some researchers or companies may feel that segment ② is more important for sustainable competitive advantage.

Additionally, the conceptual CVMS model based on the definition of CSM and key issues for CSM suggested by academics researchers and rating institutes should be researched in more in-depth from the value chain of the firm as well as the stakeholder's perspectives. Currently, the CVMS model in the dissertation considered the value chain and stakeholder engagement. But, the demand of stakeholders and the response by value chain were not reflected thoroughly enough for providing a thorough assessment of their contributions to corporate sustainable competitive advantage. For further work, the checklists prepared based on value chain to identify a firm's competence in resource management should be incorporated into the CVSM model.

Secondly, by taking the globalization of Korean companies and the meaning of sustainability into account, case studies should be extended to foreign companies in the same industry. In this manner, the sustainability level of the three Korean companies can be measured in comparison with foreign companies in the same industry. The results of such analyses could be very helpful for finding which specific division, activity, etc in a company requires urgent improvement in its sustainability activities.

Thirdly, this dissertation author sought to compare Korean companies with foreign companies with the same industry on their recent sustainability reports. The evaluations were focused upon the characterization of the 'state-of-the-art,' of sustainability management and upon the consistency of the strategic sustainability management based upon the 'Plan-Do-Check-Act' framework. .

Finally, the two empirical studies presented in Chapter 5 is based on a conceptual or qualitative analysis, therefore, the results do not include any truly quantitative performance evaluations about how much the sustainability activities of the three Korean companies contributed to improving their corporate value. In the past, some researchers have striven to identify quantitative impacts through links between environmental and social outcome and financial performance. However, these kinds of analyses have been mainly focused on the linkages between specific parts like environmental or social factors of non-business factors of sustainability and financial factors. Therefore, further study should proactively address the econometric model based on casual testing to ascertain the relationships between business and non-business factors of sustainability and of their contribution to corporate values. Taking the

characteristics of conceptual linkages between business and non-business factors into account, simultaneous equation models may be helpful. However, accumulation and transparency of related data are essential to move forward in these directions.

APPENDICES

Appendix A. Criteria of Rating Institutes including GRI

- SAM DJSI Criteria
- FTSE4Good Criteria
- Domini 400 Criteria
- SNS Asset Management/ASN Bank Criteria
- INNOVEST Strategic Value Advisors' IVA (Intangible Value Assessment) Criteria
- 2002 GRI Sustainability Report Guidelines' Indicators

Appendix B. CSM Checklists

- Economy
- Environment
- Society

Appendix A. Criteria of Rating Institutes including GRI

[SAM DJSI Criteria]

Classification		Items	Remark
Economic Dimension	Corporate Governance	1. How many members are on your Board of directors?	4.2
		2. How many Employee/Trade Union representatives, who are required by law, are on your Board/Supervisory Board?	
		3. How many Board members have executive functions in your company?	
		4. Is the Board headed by a non-executive and independent chairman and/or an independent lead director?	
		5. In the table please indicate the functions, and committee names, for which the Board explicitly assumes formal responsibility. Function / Responsibilities / Name of committee Strategy · Formal Board Responsibility Audit, accounting, risk management · Formal Board Responsibility · All member are non-executives Selection and nomination of board members and top management · Formal Board Responsibility · All member are non-executives Remuneration of board members and top management · Formal Board Responsibility · All member are non-executives Corporate social responsibility, corporate citizenship, sustainable development · Formal Board Responsibility	
		6. Please indicate if the board of directors/supervisory board of your company has issued a formal corporate governance policy and provides publicly available information regarding its corporate governance framework such as charters of committees, biographies of directors. Please attach references.	
		7. Please indicate the percentage of the main nationality represented on your Board of Directors relative to all other nationalities represented on the Board.	
		8. How many women are members on your company's Board of Directors?	
		9. Please indicate the percentage of non-audit related fees (e.g. for management consulting) paid to your auditing firm as a percentage of total fees paid to your auditing firm at corporate level in the last fiscal year.	
		10. Does your company communicate the remuneration/compensation of your board of directors/supervisory board members and other highest paid senior directors/ executives (e.g. CEO) externally? Please attach references.	
		11. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The evaluation will be filled in by the responsible analyst of your industry. No additional information is required from your company. Please disregard the reference and comment button.	
	Invest Relations	12. Please provide examples of material (e.g. analyst presentations, websites, reports, case studies, speeches etc.) used to communicate with and educate analysts and investors about sustainability issues and the relevance to your corporate strategy/bottom line.	4.2
		13. Do you conduct regular investor perception studies?	

		14. Please indicate whether your company books the current value of its employee stock option programs as expenses:	
	Strategic Planning	15. In the table, please, indicate which options of your corporate sustainability strategy are a key focus in terms of future vale generation /competitiveness enhancement. Options — Relevance to value generation/competitiveness enhancement — Comment Improve access to capital: · Strategically important · Important · Not considered as important Talent attraction(human resources): · Strategically important · Important · Not considered as important Innovation trigger(products, services): · Strategically important · Important · Not considered as important Maintaining license to operate by stakeholders (such as public, employees, NGOs etc.): · Strategically important · Important · Not considered as important Reducing environmental footprint: · Strategically important · Important · Not considered as important Future business option (e.g., new market segments): · Strategically important · Important · Not considered as important	3.0
		16. Which of the following planning methods/tools does your company systematically use for strategic planning at corporate level? ① Portfolio theory: briefly describe how it is applied: ② Real options methods: briefly describe how they are applied. ③ Scenario planning: indicate the average time horizon used: ④ Systems dynamics methods: briefly describe how it is applied: ⑤ Other, please describe: Value	
	Scorecards/Measurement Systems	17. Please indicate the main purposes of your scorecard/measurement systems (such as Balanced Scorecards or similar). Please attach/provide documents. ① To measure and integrate overall tangible and intangible corporate performance ② To act as an integrated strategic planning and management tool, linking different levels of the company ③ To share process best practice across business units ④ To compare business unit performances (Key Performance Indicators)	3.6
		18. What perspectives are integrated in your company's scorecards/measurement systems (Balanced Scorecard or similar) at a group/corporate level? ① Customer / Product perspective ② Governance / Stakeholder perspective ③ Financial / Shareholder perspective ④ Process / Internal perspective ⑤ People (Employee) / Learning perspective ⑥ Reputation perspective ⑦ Other, please specify:	
	Risk & Crisis Management	19. Please indicate the name, position and reporting line of your chief risk officer or person responsible for this function at a group level.	4.2

		20. Please indicate the name, position and reporting line of the person responsible for issue/reputation management (i.e. coordination and communication of issues with high potential risk to your company's reputation) at a group level. Please also refer to the text in the information button.	
		21. Please indicate the elements included in your company's crisis/emergency plans. Please provide supporting documents (e.g. index page of manual) ① Business continuity plan ② Communication with the media and other critical audiences/stakeholders affected ③ Co-ordination between departments involved (e.g. Public Relations, Investor Relations, Manufacturing, Customer Service, Finance and Risk Management departments) ④ Frequent rehearsal/testing of plans ⑤ Mechanisms for early internal/external notification of an emergency situation	
		22. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The evaluation will be filled in by the responsible analyst of your industry. No additional information is required from your company. Please disregard the reference and comment button.	
	Codes of Conduct/ Compliance/ Corruption & Bribery	23. Please indicate for which areas corporate codes of conduct have been defined at a group level (including subsidiaries). Please attach references. ① Corruption and bribery ② Discrimination ③ Confidentiality of information ④ Money-laundering and/or insider trading/dealing ⑤ Security of staff, business partners, customers ⑥ Environment, health and safety ⑦ Whistle blowing	4.2
		24. What mechanisms are in place to ensure effective implementation of your company's codes of conduct(e.g. compliance system)? ① Responsibilities, accountabilities and reporting lines are systemically defined in all divisions and group companies ② Dedicated help desks ③ Codes of conduct linked to employee remuneration ④ Employee performance appraisal systems integrates compliance/codes of conduct ⑤ Disciplinary actions in case of breach, i.e. zero tolerance policy ⑥ Compliance system is certified/audited/verified by third party, please specify:	
		25. Please indicate which of the following aspects are covered by your anti-corruption and bribery policy at a group level (including subsidiaries). Please refer also to the help text in the information button. Please attach references. ① Bribes in any form, including kickbacks, on any portion of contract payments or soft dollar practices ② Direct or indirect political contributions ③ Political contributions publicly disclosed. Please attach supporting documents and/or indicate web address: ④ Charitable contributions and sponsorship ⑤ Charitable contributions and sponsorship publicly disclosed. Please attach supporting documents and/or indicate web address:	
		26. Please indicate the percentage of coverage of your corruption and bribery policy relative to the total number of: ① Employees group-/worldwide: % ② Contractors/Suppliers/Service providers: % ③ Subsidiaries: % ④ Joint ventures:	
		27. Does your company publicly report on breaches of your corruption and bribery policy? Please attach references.	

		28. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The evaluation will be filled in by the responsible analyst of your industry. No additional information is required from your company. Please disregard the reference and comment button.	
	Customer Relationship Management	29. What approaches does your company use for integrating customer feedback? ① Harmonized CRM database at business unit level ② Company-wide customer database, including marketing, order, fulfillment and customer service history ③ Web-based, harmonized feedback channels ④ Integration of feedback into product/services development ⑤ Dedicated helpdesks for complaints ⑥ Customers' complaints feedback to compliance officers and/or risk managers and/or communication officers ⑦ Corporate ombudsman for complaints, please indicate name:	4.2
		30. Does your company systematically monitor customer satisfaction? ① Yes, it is monitored by third parties (e.g. mystery shopper, interviews). Please attach/provide document: ② Yes, it is monitored internally. Please attach/provide document:	
		31. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The evaluation will be filled in by the responsible analyst of your industry. No additional information is required from your company. Please disregard the reference and comment button.	
	Transparency	32. Does your company publicly endorse the "Extractive Industries Transparency Initiative (EITI)"? Please add reference(s) by using the document button below. [Answer] ① We publicly endorse the EITI. ② We report on taxes, royalties, and fees paid to governments, see indicated reference	산업특성
Environmental Dimension	Environmental Policy/ Management	33. Please indicate the name, position and reporting line of the person responsible for environmental issues at the highest level within your organization.	4.8
		34. Has your company adopted a corporate environmental policy? (whether stand alone or integrated into a broader policy statement). Please refer to the policy or indicate where it can be found on the web. If yes, please indicate whether this policy applies to: ① Company's own operations ② Environmental impacts of products & services ③ Suppliers & service providers (e.g. contractors) ④ Other key business partners (e.g. non-managed operations, JV partners, etc.), please specify:	
		35. Have quantified environmental targets been defined for the whole company? Please attach relevant documents.	
		36. Please indicate how your environmental management system is verified/audited/certified: ① ISO 14001, JIS Q 14001, EMAS certification ② Third party verification/audit/certification by specialized companies ③ Verification/audit/certification by internal specialists from headquarter	
		37. Please indicate the percentage of total revenues verified/audited/certified according to these systems:	
		38. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The evaluation will be filled in by the responsible analyst of your industry. No additional information is required from your company. Please disregard the reference and comment button.	

<table>
<tr><td></td><td>Environmental Performance (Eco-Efficiency)</td><td>39. Please complete the following table and where possible indicate your reduction targets and explain the trend and the performance against the target
<table><tr><th>Indicator</th><th>Unit</th><th>Estimated coverage(%) of total revenue/employees in year</th><th>2001</th><th>2002</th><th>2003</th><th>2004</th><th>Reduction Target for year</th><th>Please explain trend and performance against target</th></tr><tr><td>Total direct emission(ton CO_2 equivalent)
Total water use(m3)
Total Energy consumption(GJ)
Total Waste generation (ton)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></td><td>3.6</td></tr>
<tr><td></td><td>Environmental Reporting</td><td>40. In this section we evaluate the content, context and coverage of the environmental reporting included in other reports or on your website (e.g. environment report, part of a sustainability/CSR report or of annual report). The evaluation will be filled in by the responsible analyst of your industry.</td><td>1.8</td></tr>
<tr><td></td><td>Advanced Environmental Management System</td><td>41. Please indicate for which aspects corporate environmental requirements or guidelines have been developed.
① Development of new products and services
② Due-diligence/Mergers and acquisitions
③ Engineering/Maintenance
④ New projects
⑤ Non-managed operations/licensees/third-party manufacturers/JV partners
⑥ Product distribution/logistics
⑦ Production sites / Business operations
⑧ Other, please specify</td><td rowspan="4">Industry Specific</td></tr>
<tr><td></td><td></td><td>42. How frequent is environmental data reported by operations/business units to the corporate center (e.g. emissions to air, water, land, resource consumption, accidents)? Monthly/Quarterly/Yearly/Irregularly etc.</td></tr>
<tr><td></td><td></td><td>43. Does your company have a centralized database for environmental data that is accessible from various parts of your organization?</td></tr>
<tr><td></td><td></td><td>44. Please indicate which cooling systems for high temperature differences are used in your steel plants.</td></tr>
<tr><td></td><td></td><td>45. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The score will be filled in by the responsible analyst of your industry.</td></tr>
</table>

	Advanced Environmental Performance	46. Please complete the following table (or attach documents) with your company-wide environmental data and explain trends. Please complete the following table (or attach documents) with your company-wide environmental data and explain trends. By default, we normalize the data by sales. If you think this is inappropriate, you may provide adequate denominators (volumes, net value added) or provide normalized/indexed values in the column indicated. Indicator | Unit | Estimated coverage(%) of total revenue/employees in year | 2001 | 2002 | 2003 | 2004 | Reduction Target for year | Please explain trend and performance against target Scrap material from steel in % of primary production SO2 emission(ton) NOx (ton) Dust emission (ton PM 10) Use of post-consumer recycled “raw material” as % of total raw material consumption If above indicators are irrelevant or not applicable please consider KPIs that are more relevant to your business in the following box:	Industry specific
	Climate Strategy	47. Please indicate the organizational coverage of your company's GHG inventory: ① For wholly owned entities/facilities representing100% of total revenue ② For entities/facilities controlled but not wholly owned ③ For jointly controlled assets/entities ④ For entities not controlled but over which the company has significant influence	Industry specific
		48. Please indicate the scope of your company's GHG inventory (according to WBCSD/WRI Protocol or other): ① Direct GHG emissions (i.e. "scope 1" of WBCSD/WRI Protocol) ② GHG emissions from imports of electricity, heat or steam (i.e. "scope 2" WBCSD/WRI Protocol) ③ Other indirect GHG emissions (i.e. "Scope 3" of the WBCSD/WRI Protocol)	
		49. Please indicate which independent organization verifies your company's GHG inventory.	
		50. On what is your company's strategy for reducing/managing carbon risk based? ① Based on intra-company emissions trading ② Based on national/international emissions trading ③ Based on carbon sequestration projects ④ Based on Clean Development Mechanisms (CDM) ⑤ Based on Joint Implementation (JI) projects ⑥ Based on switching fuel sources ⑦ Based on reducing carbon intensive operations/technologies/products/services ⑧ Other, please specify	
		51. What is your company's target for reducing GHG emissions and how will this target be achieved? (including sources of emissions covered, baseline, timescale, etc.) Please specify.	
	Biodiversity	52. Has your company adopted a specific biodiversity policy? Please add reference by using the document button below.	Industry

		53. Does your company monitor and assess the impact of existing operations on biodiversity? Please add reference by using the document button below.	specific
		54. How does your company assess the impact on biodiversity of proposed projects? ① Integrated into Environmental Impact Assessment (EIA) ② Stakeholder consultation ③ Verify with designated habitats under IUCN ④ Others, please specify	
		55. Does your company adopt any international guidelines (such as IUCN land category or UNESCO World Heritage) to define 'no go' areas?	
		56. Please indicate the estimated percentage share of total operated and non-operated assets which occur within IUCN I-IV management categories. 2004 2010 Assets located in IUCN I-IV categories as a percentage of total assets	
		57. Does your company have a policy in place to guarantee the rehabilitation of sites? If yes, is this policy externally communicated? Please add reference by using the document button below.	
		58. Please indicate the percentage share of your operations at which monitoring systems to prevent habitat contamination are implemented in relation to total number of operations in 2003.	
		59. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The score will be filled in by the responsible analyst of your industry.	
Social Dimension	Labor Practice Indicators	60. Please complete the table and indicate which of the following performance/management indicators your company use regarding the following labor relations related issues, and are these externally communicated? Please provide documents and/or indicate web address.	2.4

Issue	Management / Performance indicator	Communication
Non-Discrimination / Diversity (ILO convention No. 111)	· Female of total workforce · Female in management positions of total workforce · Breakdown of workforce based on minority, culture or similar · Other diversity indicator,	· Externally · Internally
Equal Remuneration female/male (ILO convention No. 100)	· Executive level: average salary / female : male · Management lever '/ female : male · Non-management level / female: male	· Externally · Internally
Freedom of Association (ILO convention No. 87; No 100)	· Employees represented by an independent trade union or covered by collective bargaining agreement · Consultations, negotiation with trade unions over organizational changes · Other indicators, please specify;	· Externally · Internally
Layoffs (based on ILO's A Guide to Worker Displacement)	· Number of employees paid off in the last fiscal year · Consultations, negotiations with employees over organizational change(e.g., restructuring, outsourcing) · Other indicator	· Externally · Internally
Health and Safety (Based on ILO's codes of practices SafeWork)	· Tracking of safety performance · Tracking of work-related fatalities · Tracking of near misses of similar crisis events · Other indicators, please specify;	· Externally · Internally

61. Please indicate which systems are in place to collect and handle employee grievances and complaints to ensure that workers can raise their concerns in confidentiality.
① Help line

		② Whistleblowing policy ③ Company own ombudsman, please indicate name: ④ Counseling ⑤ Strict confidentiality ensured. Please specify: ⑥ Policies and related information widely circulated in appropriate languages	
		62. Does your company publicly endorse (having signed or publicly acknowledging adherence to) one or more of the following charters/frameworks? ① UN Universal Declaration of Human Rights ② ILO Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy ③ OECD Guidelines for Multinational Enterprises ④ Other national charters related to labor practices/basic rights issues (e.g. based on above mentioned guidelines), please specify and attach document:	
		63. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The evaluation will be filled in by the responsible analyst of your industry. No additional information is required from your company. Please disregard the reference and comment button.	
	Human Capital Development	64. Does your company measure and control the long-term success of your human resource policies in a formal/standardized way (e.g. based on indicators such as employee satisfaction)? If yes, please indicate which performance indicators your company uses: ① Qualitative operating indicators/ratios (e.g. employee satisfaction, degree of implementation of HR projects etc.) ② Non-financial operating indicators/ratios (e.g. number of hours spent in training, staff turnover rate number of staff out sick, etc.) ③ Cost-based financial indicators/ratios (e.g. training cost per employee) ④ Investment- or value-based financial indicators/ratios (e.g. ROI - Return on investment, EVA - Economic value added, CVA - Cash value added) ⑤ Human resource-based financial indicators/ratios (e.g. VAP - value added per person, margin per employee)	3.6
		65. Does your company have a medium-term workforce and skills plan comparing current employees and their skills with the future number, type and skills of employees required to execute the business plan? ① Yes, available for business/performance units generating more than 75% of total revenue ② Yes, available for business/performance units generating 50% - 75% of total revenue ③ Yes, available for business/performance units generating less than 50% of total revenue	
		66. Please indicate the percentage of skilled employees and executives receiving a regular (e.g. at least once per year) formal evaluation of their performance (performance appraisal)	
		67. Please indicate how senior/middle management is appraised. ① Regular performance appraisal by line superior ② Multidimensional performance appraisal (e.g. line superior plus upward feedback plus 360 degree feedback) ③ Systematic use of agreed measurable targets and indicators (e.g. project completion) ④ Formal comparative ranking of managers	
		68. Please indicate the percentage of employees to follow a company training program specific to their job category (e.g. sales manager) before or at the onset of their job/position.	
	Talent Attraction & Retention	69. Please indicate the percentage of employees hired based on a validated recruitment process/selection test (e.g. quality of hiring process statistically tested or verified with checklists) in the last fiscal year. For additional information please refer to the information button.	3.0
		70. Please indicate the percentage of skilled employees (managerial, professional and technical employees) leaving the company in the course of the past year relative to the total average number of skilled employees during the last year:	

		71. Please indicate the percentage of your workforce that is systematically re-assigned within the company or in extreme cases out placed because of weak individual performance relative to the total average number of total workforce during the last fiscal year.	
		72. Does your company regularly track and benchmark employee satisfaction against industry peers with regard to the following issues? ① Rewards and recognition ② Leadership ③ Supportive/collaborative team environment ④ Personal development possibilities ⑤ Job satisfaction/opportunity to make a difference ⑥ Working environment (Health and safety, social climate, etc.) ⑦ Identification with corporate values and strategy ⑧ Other, please specify	
		73. Based on your company's employee satisfaction surveys, please characterize the satisfaction level of your employees relative to the previous survey period. Please provide documents and/or indicate web address ① Higher level of employee satisfaction ② Constant level of employee satisfaction ③ Decreased level of employee satisfaction	
		74. What percentage of compensation/annual salary (excluding fringe benefits such as pension plans or company car) of skilled employees and managers is on average performance related for: ① Top/Senior management: % ② Middle/Lower management: % ③ Sales Staff: % ④ Technical specialists: % ⑤ Overall company average: %	
		75. For the overall company, what percentage of performance related compensation is on average constituted by: Type of performance related compensation — Percentage (%) Stock of other form of stock related compensation(eg, option) Other long-term compensation(not directly stock-related) Profit shares (or similar) Sales or order commission (or similar) Bonus pool based on profit, divided up based on management assessment Scorecard target bonus set in relation to salary granted on the basis of management assessment Other, please specify:	
		76. Please indicate the group-wide employee benefits provided by your company in addition to government schemes. ① Pension plans ② Health and/or accident insurance ③ Medical care for employee families ④ Disability insurance/programs	

		⑤ Maternity and/or paternity leave ⑥ Child care ⑦ Employee assistance program ⑧ Other, please specify	
		77. Does your company offer the choice of supplementary private pension plans with a sustainability/socially responsible component to its employees?	
		78. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The evaluation will be filled in by the responsible analyst of your industry. No additional information is required from your company. Please disregard the reference and comment button.	
	Knowledge Management / Organizational learning	79. Please indicate if formal organizational learning/ knowledge management systems are in place at your company and the percentage of employees involved in them.	3.0
		80. In the table please indicate the relative importance of the different aims of your knowledge management/organizational learning systems to support the execution of your corporate strategy. Aim of system / Importance to support execution of strategy / Comment Increase efficiency: · Strategically important · Important · Not considered as important Support innovation: · Strategically important · Important · Not considered as important Reduce risk, early warning system: · Strategically important · Important · Not considered as important Enhance learning and the intellectual capital of the firm: · Strategically important · Important · Not considered as important Improve understanding of strategy and vision: · Strategically important · Important · Not considered as important Categorize and structure information: · Strategically important · Important · Not considered as important	
		81. Please indicate the tools/processes widely adopted by your company to manage organizational learning and knowledge management. ① Experts directories ② Informal knowledge/learning networks ③ Formal knowledge/learning networks with regular meetings and staff support ④ Intranet based knowledge repositories/databases ⑤ Intranet based interactive knowledge platforms integrated into daily work processes ⑥ Peer group Key Performance Indicator comparisons across Business Units ⑦ Systematically accessible descriptions of best practice processes ⑧ Collaboration/ knowledge sharing as formal feedback criterion ⑨ Bonus directly related to collaboration/ knowledge sharing	

		⑩ Company academy/ university ⑪ Other, please specify:	
	Standards for Suppliers	82. In which of the following areas has your company defined group-wide corporate requirements/guidelines for the selection and ongoing evaluation of key suppliers and service providers at a group level. Please attach examples of such guidelines. ① Environment ② Labor standards/employment practices ③ Occupational health & safety ④ Human rights (ILO conventions) ⑤ External supplier audits/assurance (e.g. AA1000): please specify: ⑥ Other, please specify:	3.0
		83. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The evaluation will be filled in by the responsible analyst of your industry. No additional information is required from your company. Please disregard the reference and comment button.	
	Stakeholder Engagement	84. Please indicate how your company engages with external stakeholders. Please attach/provide supporting documents or indicate website. ① Identification, prioritization and mapping of key stakeholders for input into corporate strategy. ② Regular briefings/meetings in form of stakeholder dialogue workshops ③ Feedback from stakeholders to board/supervisory board and/or senior directors and/or compliance and/or communication department ④ Ongoing long-term project teams/partnerships. Examples: ⑤ Other, please describe:	1.8
		85. Does your company regularly conduct satisfaction surveys or perception studies of the following stakeholders? Please provide supporting documents or indicate website. ① Governments, authorities ② Interest groups, such as consumer organizations ③ Local communities ④ Media ⑤ Non-governmental organizations (NGOs) ⑥ Suppliers / Service providers ⑦ Minority groups, such as disabled customers ⑧ Trade Unions	
		86. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The evaluation will be filled in by the responsible analyst of your industry. No additional information is required from your company. Please disregard the reference and comment button.	
	Corporate Citizenship /Philanthropy	87. Is your company's philanthropic/ corporate citizenship/social responsibility strategy aligned with your corporate strategy? Focus of Giving Percentage (%) Communal obligation (citizenship, supporting the community and responding to community needs) Context focused addressing social, environmental and economies goals that improve a company's competitive context, e.g., by creating access to new markets Relationship building with employees by maintaining license to operate by building goodwill	3.0

		Relationship building with customer by maintaining license to operate by building goodwill Enhance corporate reputation If yes, please indicate the focus of your company's philanthropic spending by allocating 100% across the following aspects to reflect where you focus your company's giving.	
		88. Please indicate your company's philanthropic contributions / voluntary social investments in the following categories. Please attach references. ① Employee volunteerism ② Capacity Building: such as skill donation, management advice ③ Long-term partnerships with communities, voluntary organizations in fields such as education, health ④ Projects using company's distribution and logistic networks for philanthropic purposes ⑤ Other. Please specify	
		89. Does your company have a system in place to systematically measure the impact of your company's contributions in order to further improve/re-align the company's philanthropic/social investment strategy: ① Business outcomes and impact (e.g product innovation) ② Social outcomes and impact ③ Impact on corporate reputation and stakeholder satisfaction ④ Other, please specify:	

90. Please estimate the monetary value of your company's philanthropic contributions/voluntary social investments in the following categories in the last fiscal year.

Types of contribution	Amount
Cash contribution	
In-kind giving; Employee volunteering during paid working hours	
In-kind giving; Product or service donations, Projects/partnerships or similar	
Total	

	Social Reporting	91. In this section we evaluate the content, context and coverage of the social reporting included in other reports or on your website (e.g. social report, part of a sustainability/CSR report or of annual report). The evaluation will be filled in by the responsible analyst of your industry.	2.4
	Social Impacts on Communities	92. For what project types does your company engage with affected local communities to gain informed consent? Please specify. How does your company ensure effective participation of all community members (elderly people, women) in the process of gaining informed consent? Please describe or refer to documents by using the document button below.	Industry Specific
		93. For what project types does your company implement jointly managed grievance mechanisms (allowing local community representatives to submit grievances to an independent body comprising company and external representatives)?	
		94. Please report the percentage share of facilities at which translations of corporate policies in local language exist.	
		95. Does your company publicly report on the implementation of labor standards, employment practices and human rights policy/issue statement/paper? Please add reference to documents by using the document button below.	
		96. Does your company conduct environmental impact assessments (EIA's) and/or social impact assessments (SIA's) for new operations or extensions of existing operations when such studies are not required by local legislation?	

		Is a formal system in place ensuring that EIA and/or SIA recommendations are implemented and followed up during project construction, commissioning and operation? If so, who is accountable for implementation and follow up within your organization?	
		97. Please indicate how your company compensates local communities when relocation is required due to your company's activities? ① Land compensation ② Infrastructure development ③ Education and training Does your company differentiate between informal and formal land users with respect to the above compensation scheme? Please describe your company's approach and indicate reasons	
		98. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The score will be filled in by the responsible analyst of your industry.	
	Occupational Health & Safety	99. Please complete the following table with your company's lost-time injuries frequency rate (lost-time injuries per 200,000 hours worked) for employees and contractors: LITFR Unit 2001 2002 2003 2004 Please explain trend Employees Contractors	Industry specific
		100. Please complete the following table with the number of fatalities for employees and contractors: LITFR Unit 2001 2002 2003 2004 Please explain trend Employees Contractors	
		101. Please indicate your company's occupational illness frequency rate (OIFR) for employees for the year 2003.	
		102. Please specify your corporate Occupational, Health & Safety targets or refer to documents by using the document button below:	
		103. Please indicate the percentage of employees subject to annual medical screening:	
		104. In this section we include a performance score on the Corporate Sustainability Monitoring with the objective to verify the company's involvement and management of crisis situations that can have a damaging effect on reputation. The score will be filled in by the responsible analyst of your industry.	

Source: www.sam-group.com

[FTSE4Good Criteria]

<table>
<tr><th rowspan="2">Classification</th><th rowspan="2">Items</th><th colspan="3">In detail</th></tr>
<tr><th>High Impact Sector</th><th>Medium Inpact Sectors</th><th>Low Impact Sector</th></tr>
<tr><td rowspan="5">Environment</td><td rowspan="2">Policy</td><td>Policy must cover the whole group and either:
• Meet all five core indicators plus at least one desirable indicator
• Or meet four core plus two desirable indicators</td><td>Policy must cover the whole group and meet at least four indicators, at least three of which must be core.</td><td>Companies must have published a policy statement including at least one commitment indicator.</td></tr>
<tr><td>Core indicators
• Policy refers to all key issues
• Responsibility for policy at board or department level
• Commitment to use of targets
• Commitment to monitoring and audit
• Commitment to public reporting</td><td colspan="2">Desirable indicators
• Globally applicable corporate standards
• Commitment to stakeholder involvement
• Policy addresses product or service impact
• Strategic moves towards sustainability</td></tr>
<tr><td rowspan="2">Management</td><td>If environmental management systems (EMS) are applied to between one ad two-thirds of company activities, all six indicators must be met, and targets must be quantified.
If ESM are applied to more than two-thirds of company must meet at least five of the indicators, one of which must be documented objectives and targets in all key areas.
ISO certification and EMAS registrations are considered to meet all six indicators and are assessed on that basis.</td><td>EMS must cover at least one third of the company and meet at least four indicators.
If less than one third coverage, must have six indicators, including quantitative objectives and targets. ISO 14001 certified or EMAS registered systems are considered to meet all six indicators.</td><td>No requirement.</td></tr>
<tr><td colspan="3">Indicators
• Presence of environmental policy
• Identification of significant impacts
• Documented objectives and targets in key areas
• Outline of processes and responsibilities, manuals, action plans, procedures
• Internal audits against the requirements of the system (not limited to legal compliance)
• Internal reporting and management review</td></tr>
<tr><td>Reporting</td><td>Report must have been published within the last three years, cover the whole group, and meet at least three of the four indicators.
Corporate reports which do not cover the entire the global operations of the listed company must meet all four core indicators.</td><td>No requirement.</td><td>No requirement</td></tr>
</table>

<table>
<tr><td></td><td></td><td>Core Indicators
• Text of environmental policy
• Description of main impacts
• Quantitative data
• Performance measured against targets</td><td colspan="2">Desirable Indicators
• Outline of a EMS
• Non-compliance, prosecution, fines, accidents
• Financial dimensions
• Independent verification
• Stakeholder dialogue
• Coverage of sustainability issues</td></tr>
<tr><td></td><td></td><td colspan="3"><table>
<tr><th>High Impact Sectors</th><th>Medium Impact Sectors</th><th>Low Impact Sectors</th></tr>
<tr><td>Agriculture
Air Transport
Airports
Building Materials (includes Quarrying)
Chemicals and Pharmaceuticals
Construction
Major Systems Engineering
Fast Food Chains
Food, Beverages and Tobacco
Forestry and Paper
Mining & Metals
Oil and Gas
Power Generation
Road Distribution and Shipping
Supermarkets
Vehicle Manufacture
Waste
Water
Pest Control</td><td>DIY & Building Supplies
Electronic and Electrical equipment
Energy and Fuel Distribution
Engineering and Machinery
Financials not elsewhere classified
Hotels, Catering and Facilities Management
Manufacturers not elsewhere classified
Ports
Printing & Newspaper Publishing
Property Developers
Retailers not elsewhere classified
Vehicle Hire
Public Transport</td><td>Information Technology
Media
Consumer / Mortgage Finance
Property Investors
Research & Development
Leisure not elsewhere classified (Gyms and Gaming)
Support Services
Telecoms
Wholesale Distribution</td></tr>
</table></td></tr>
<tr><td rowspan="6">Human Rights</td><td rowspan="6">Policy</td><td>• Public Policy</td><td colspan="2">• The company has published policies covering human rights issues that are clearly communicated globally (in local languages where appropriate)</td></tr>
<tr><td>• Board Responsibility</td><td colspan="2">• The strategy responsibility for the human rights policy/ies rests with one or more Board members or senior managers who reports directly to the CEO.</td></tr>
<tr><td>• ILO core labor standards or UN Global Compact/ SA 8000/ OECD Guidelines</td><td colspan="2">• A statement of commitment to respect all the ILO core labor standards globally. The core conventions relate to: equal opportunities, freedom of association/ collective bargaining, forced labor and child labor. Alternatively signatories to the UN Global Compact or SA 8000, or whose policy states support for the OECD Guidelines for Multi-national Enterprises are considered to meet this requirement.</td></tr>
<tr><td>• UDHR</td><td colspan="2">• A clear statement of support for the Universal Declaration of Human Rights.</td></tr>
<tr><td>• Guidelines on armed security guards</td><td colspan="2">• Guidelines governing the use of armed security guards based on UN Basic principles on the Use of Force and Firearms by Law Enforcement Officials or the Code of Conduct for Law Enforcement Officials. Alternatively signatories to the Voluntary Principles on Security and Human Rights meet this requirement.</td></tr>
</table>

		• Indigenous people	• A stated commitment to respecting indigenous peoples' rights.
	Management	• Implementing policy criteria and monitoring	• Monitoring the implementation of its human rights policy including the existence of procedures to remedy any non-compliance
		• Employee Human Rights training	• Training for employees globally in its human rights policy
		• Stakeholder Consultation	• Consulting with independent local stakeholders in the countries of concern.
		• Human Rights impact assessment	• Evidence of a human rights impact assessment which includes the company identifying the major human rights issues it faces and integrating human rights concerns into its risk assessment procedures.
	Reporting	• Produce a human rights report	• Reporting on the human rights policy and performance to the public in a published format.
		• Cover policies and management systems	• As a minimum covering policies and management systems
Social & Stakeholder	Policy	• Adopting an equal opportunities policy and/or including a commitment to equal opportunities or diversity in their annual report or web-site • Adopting c Code of Ethics or Business Principles	
	Management	• Providing evidence of equal opportunities systems including one or more of; − monitoring of the policy and workforce composition − flexible working arrangements and family benefits (meaning at least three of flexible working time, child care support, job sharing, career breaks, or maternity or paternity pay beyond the legal requirements) − more than 10% of managers being women or the proportion of managers who are women or from ethnic minorities exceeding two fifth of their representation in the workforce concerned • Providing evidence of health and safety systems including one or more of; − Awards − details of health and safety training − published accidents rates • Providing evidence of training and employee development systems including one or more of; − Annual training reviews for staff (more than 25% of those staff where figures are available) − Providing significant data on time and money spent on training • Providing evidence of systems to maintain good employee relations including union recognition agreements or other consultative arrangements (covering more than 25% of staff where figures are available).	
	Practice/ Performance	• Or one of the following − Making charitable donations in excess of 50,000 pound, or − Operating payroll giving schemes, or − Providing gifts in kind or staff secondments to community schemes, or − Assigning responsibility for charitable donations or community relations to a senior manager	

Source: www.ftse4good.com

[Domini 400 Criteria]

Classification	Items		In detail
Community	Strengths	• ***Generous Giving***	• The company has consistently given over 1.5% of trailing three-year net earnings before taxes (NEBT) to charity, or has otherwise been notably generous in its giving.
		• ***Innovative Giving***.	• The company has a notably innovative giving program that supports nonprofit organizations, particularly those promoting self-sufficiency among the economically disadvantaged. Companies that permit nontraditional federated charitable giving drives in the workplace are often noted in this section as well.
		• ***Non-US Charitable Giving***	• The company has made a substantial effort to make charitable contributions abroad, as well as in the U.S. To qualify, a company must make at least 20% of its giving, or have taken notably innovative initiatives in its giving program, outside the U.S.
		• ***Support for Housing***	• The company is a prominent participant in public/private partnerships that support housing initiatives for the economically disadvantaged, e.g., the National Equity Fund or the Enterprise Foundation.
		•	
		• ***Support for Education***	• The company has either been notably innovative in its support for primary or secondary school education, particularly for those programs that benefit the economically disadvantaged, or the company has prominently supported job-training programs for youth.
		• ***Other Strength***	• The company has either an exceptionally strong volunteer program, in-kind giving program, or engages in other notably positive community activities.
	Concerns	• ***Investment Controversies***	• The company is a financial institution whose lending or investment practices have led to controversies, particularly ones related to the Community Reinvestment Act.
		• ***Negative Economic Impact***	• The company's actions have resulted in major controversies concerning its economic impact on the community. These controversies can include issues related to environmental contamination, water rights disputes, plant closings, "put?or?pay" contracts with trash incinerators, or other company actions that adversely affect the quality of life, tax base, or property values in the community.
		• ***Other Concern***	• The company is involved with a controversy that has mobilized community opposition, or is engaged in other noteworthy community controversies
Corporate Governance	Strengths	• ***Limited Compensation***	• The company has recently awarded notably low levels of compensation to its top management or its board members. The limit for a rating is total compensation of less than $500,000 per year for a CEO or $30,000 per year for outside directors.
		• ***Ownership Strength***	• The company owns between 20% and 50% of another company KLD has cited as having an area of social strength, or is more than 20% owned by a firm that KLD has rated as having social strengths. When a company owns more than 50% of another firm, it has a controlling interest, and KLD treats the second firm as if it is a division of the first.
		• ***Other Strength***	• The company has an innovative compensation plan for its board or executives, a unique and positive corporate culture, or some other initiative not covered by other KLD ratings.
	Concerns	• ***High Compensation***	• The company has recently awarded notably high levels of compensation to its top management or its board members. The limit for a rating is total compensation of more than $10 million per year for a CEO or $100,000 per year for outside directors.
		• ***Tax Disputes***	• The company has recently been involved in major tax disputes involving more than $100 million with the Federal, state, or local authorities.
		• ***Ownership Concern.***	• The company owns between 20% and 50% of a company KLD has cited as having an area of social concern, or is more than 20% owned by a firm KLD has rated as having areas of concern. When a company owns more than 50% of another firm, it has a controlling interest, and KLD treats the second firm as if it is a division of the first.
		• ***Other Concern***	• The company restated its earnings over an accounting controversy, has other accounting problems, or is involved with some other controversy not covered by other KLD ratings.

Diversity	Strengths	• *CEO*	• The company's chief executive officer is a woman or a member of a minority group.
		• ***Promotion.***	• The company has made notable progress in the promotion of women and minorities, particularly to line positions with profit-and-loss responsibilities in the corporation.
		• ***Board of Directors***	• Women, minorities, and/or the disabled hold four seats or more (with no double counting) on the board of directors, or one-third or more of the board seats if the board numbers less than 12.
		• ***Work/Life Benefits***	• The company has outstanding employee benefits or other programs addressing work/life concerns, e.g., childcare, elder care, or flextime.
		• ***Women & Minority Contracting***	• The company does at least 5% of its subcontracting, or otherwise has a demonstrably strong record on purchasing or contracting, with women- and/or minority-owned businesses.
		• ***Employment of the Disabled***	• The company has implemented innovative hiring programs, other innovative human resource programs for the disabled, or otherwise has a superior reputation as an employer of the disabled.
		• ***Gay & Lesbian Policies***	• The company has implemented notably progressive policies toward its gay and lesbian employees. In particular, it provides benefits to the domestic partners of its employees.
		• ***Other Strength***	• The company has made a notable commitment to diversity that is not covered by other KLD ratings.
	Concerns	• ***Controversies***	• The company has either paid substantial fines or civil penalties as a result of affirmative action controversies, or has otherwise been involved in major controversies related to affirmative action issues.
		• ***Non-Representation***	• The company has no women on its board of directors or among its senior line managers.
		• ***Other Concern***	• The company is involved in diversity controversies not covered by other KLD ratings.
Employee Relations	Strengths	• ***Union Relations***	• The company has a history of notably strong union relations.
		• ***Cash Profit Sharing***	• The company has a cash profit-sharing program through which it has recently made distributions to a majority of its workforce.
		• ***Employee Involvement***	• The company strongly encourages worker involvement and/or ownership through stock options available to a majority of its employees, gain sharing, stock ownership, sharing of financial information, or participation in management decision-making.
		• ***Retirement Benefits***	• The company has a notably strong retirement benefits program.
		• ***Other Strength***	• The company is noted by the US Occupational Health and Safety Administration for its safety programs, or has other strong employee relations initiatives not covered by other KLD ratings.
	Concerns	• Union Relations	• The company has a history of notably poor union relations.
		• Safety Controversies	• The company recently has either paid substantial fines or civil penalties for willful violations of employee health and safety standards, or has been otherwise involved in major health and safety controversies.
		• Workforce Reductions	• The company has reduced its workforce by 15% in the most recent year or by 25% during the past two years, or it has announced plans for such reductions.
		• Retirement Benefits Concern	• The company has either a substantially underfunded defined benefit pension plan, or an inadequate retirement benefits program.
		• Other Concern.	• The company is involved in an employee relations controversy that is not covered by other KLD ratings.
Environment	Strengths	• Beneficial Products and Services	• The company derives substantial revenues from innovative remediation products, environmental services, or products that promote the efficient use of energy, or it has developed innovative products with environmental benefits. (The term "environmental service" does not include services with questionable environmental effects, such as landfills, incinerators, waste-to-energy plants, and deep injection wells.)
		• Clean Energy	• The Company has taken significant measures to reduce its impact on climate change and air pollution through use of renewable energy and clean fuels or through energy efficiency. The Company has demonstrated a commitment to promoting climate-friendly policies and practices outside its own operations.
		• Pollution Prevention	• The company has notably strong pollution prevention programs including both emissions reductions and toxic-use reduction programs.
		• Recycling	• The company either is a substantial user of recycled materials as raw materials in its manufacturing processes, or a major factor in the recycling industry.
			• The company derives substantial revenues from alternative fuels. The term "alternative fuels" includes natural gas, wind power, and solar energy. The

		• Alternative Fuels	company has demonstrated an exceptional commitment to energy efficiency programs or the promotion of energy efficiency.
			• The company is a signatory to the CERES Principles, publishes a notably substantive environmental report, or has notably effective internal communications systems in place for environmental best practices.
		• Communications	• The company has demonstrated a superior commitment to management systems, voluntary programs, or other environmentally proactive activities.
	Concerns	• Hazardous Waste	• The company's liabilities for hazardous waste sites exceed $50 million, or the company has recently paid substantial fines or civil penalties for waste management violations.
		• Regulatory Problems	• The company has recently paid substantial fines or civil penalties for violations of air, water, or other environmental regulations, or it has a pattern of regulatory controversies under the Clean Air Act, Clean Water Act or other major environmental regulations.
		• Ozone Depleting Chemicals	• The company is among the top manufacturers of ozone depleting chemicals such as HCFCs, methyl chloroform, methylene chloride, or bromines.
		• Substantial Emissions	• The company's legal emissions of toxic chemicals (as defined by and reported to the EPA) from individual plants into the air and water are among the highest of the companies followed by KLD.
		• Agricultural Chemicals	• The company is a substantial producer of agricultural chemicals, i.e., pesticides or chemical fertilizers.
		• Climate Change	• The company derives substantial revenues from the sale of coal or oil and its derivative fuel products, or the company derives substantial revenues indirectly from the combustion of coal or oil and its derivative fuel products. Such companies include electric utilities, transportation companies with fleets of vehicles, auto and truck manufacturers, and other transportation equipment companies.
			• The company has been involved in an environmental controversy that is not covered by other KLD ratings.
Human Rights	Strengths	• ***Indigenous Peoples Relations Strength***	• The company has established relations with indigenous peoples near its proposed or current operations (either in or outside the U.S.) that respect the sovereignty, land, culture, human rights, and intellectual property of the indigenous peoples.
		• ***Labor Rights Strength***	• The company has outstanding transparency on overseas sourcing disclosure and monitoring, or has particularly good union relations outside the U.S.
		• ***Other Strength***	• The company has undertaken exceptional human rights initiatives, including outstanding transparency or disclosure on human rights issues, or has otherwise shown industry leadership on human rights issues not covered by other KLD human rights ratings.
	Concerns	• ***Burma Concern***	• The company has operations or investments in or sourcing from, Burma.
		• ***Labor Rights Concern***	• The company's operations outside the U.S. have had major recent controversies related to employee relations and labor standards or its U.S. operations have had major recent controversies involving sweatshop conditions or child labor.
		• ***Indigenous Peoples Relations Concern***	• The company has been involved in serious controversies with indigenous peoples (either in or outside the U.S.) that indicate the company has not respected the sovereignty, land, culture, human rights, and intellectual property of indigenous peoples.
		• ***Other Concern***	• The company's operations outside the U.S. have been the subject of major recent human rights controversies not covered by other KLD ratings.
Products	Strengths	• Quality	• The company has a long-term, well-developed, company-wide quality program, or it has a quality program recognized as exceptional in U.S. industry.
			• The company is a leader in its industry for research and development (R&D), particularly by bringing notably innovative products to market.
		• R&D/Innovation	• The company has as part of its basic mission the provision of products or services for the economically disadvantaged.
		• Benefits to Economically Disadvantaged	• The company's products have notable social benefits that are highly unusual or unique for its industry.
	Concerns	• Product Safety	• The company has recently paid substantial fines or civil penalties, or is involved in major recent controversies or regulatory actions, relating to the safety of its products and services.
		• Marketing/Contracting Controversy	• The company has recently been involved in major marketing or contracting controversies, or has paid substantial fines or civil penalties relating to advertising practices, consumer fraud, or government contracting.
		• Antitrust	• The company has recently paid substantial fines or civil penalties for antitrust violations such as price fixing, collusion, or predatory pricing, or is involved in recent major controversies or regulatory actions relating to antitrust allegations.
		• Other Concern	• The company has major controversies with its franchises, is an electric utility with nuclear safety problems, defective product issues, or is involved in other product-related controversies not covered by other KLD ratings.

Source: www.domini.com

CONTROVERSIAL BUSINESS ISSUES

Items	Controversial Issues
ABORTION	•Manufacturers: Companies that are engaged in the development or manufacture of abortifacients, including methotrexate, misoprostol, and RU 486. •Ownership and Operation of Acute Care Facilities: Companies that own or operate one or more acute care hospitals or surgical centers that provide general medical services, including abortions and contraceptive surgical procedures. •Ownership of an Abortion Company: The company owns more than 20% of another company with abortion involvement. (When a company owns more than 50% of company with abortion involvement, KLD treats the abortion company as a consolidated subsidiary.) •Ownership by an Abortion Company: The company is more than 50% owned by a company with abortion involvement.
ADULT ENTERTAINMENT	•Distributors: The report includes publicly traded U.S. companies that derive 15% of more of total revenues from the rental, sale, or distribution (wholesale or retail) of adult entertainment media products. •Owners and Operators: The report includes publicly traded U.S. companies that own and/or operate adult entertainment establishment. Providers. The report includes publicly traded U.S. companies that offer pay-per-view adult entertainment. •Ownership of an Adult Entertainment Company: The Company owns more than 20% of another company with adult entertainment involvement. (When a company owns more than 50% of company with adult entertainment involvement, KLD treats the adult entertainment company as a consolidated subsidiary.) •Ownership by an Adult Entertainment Company: The Company is more than 50% owned by a company with adult entertainment involvement.
ALCOHOL	•Licensing: The Company Licenses its company or brand name to alcohol products. •Manufacturers: Companies that are involved in the manufacture alcoholic beverages including beer, distilled spirits, or wine. •Retailers: Companies that derive 15% or more of total revenues from the distribution (wholesale or retail) of alcoholic beverages. •Manufacturers of Products Necessary for Production of Alcoholic Beverages. Companies that derive 15% or more of total revenues from the supply of raw materials and other products necessary for the production of alcoholic beverages. •Ownership of an Alcohol Company: The Company owns more than 20% of another company with alcohol involvement. (When a company owns more than 50% of company with alcohol involvement, KLD treats the alcohol company as a consolidated subsidiary.) •Ownership by an Alcohol Company: The Company is more than 50% owned by a company with alcohol involvement.
CONTRACEPTIVES	•Licensing: The Company Licenses its company or brand name to contraceptive products. •Manufacturers: Companies that derive identifiable revenues from the development or manufacture of contraceptives, including cervical caps; condoms; contraceptive implants; contraceptive patches; contraceptive vaccines; diaphragms; intrauterine devices (IUDs); oral contraceptives; and spermicides. •Ownership of a Contraceptive Company: The Company owns more than 20% of another company with contraceptive involvement. (When a company owns more than 50% of company with contraceptive involvement, KLD treats the contraceptive company as a consolidated subsidiary.) •Ownership by a Contraceptive Company: The Company is more than 50% owned by a company with contraceptive involvement.
FIREARMS	•Manufacturers: The Company is engaged in the production of small arms ammunition or firearms, including, pistols, revolvers, rifles, shotguns, or sub-machine guns. •Retailers: The Company derives 15% or more of total revenues from the distribution (wholesale or retail) of firearms and small arms ammunition. •Ownership of a Firearms Company: The Company owns more than 20% of another company with firearms involvement. (When a company owns more than 50% of company with firearms involvement, KLD treats the firearms company as a consolidated subsidiary.) •Ownership by a Firearms Company: The Company is more than 50% owned by a company with firearms involvement.
GAMBLING	•Licensing: The Company Licenses its company or brand name to gambling products. •Owners and Operators: Companies that own and/or operate casinos, racetracks, bingo parlors, or other betting establishments, including casinos; horse, dog, or other race tracks that permit wagering; lottery operations; on-line gambling; pari-mutuel wagering facilities; bingo; Jai-alai; and other sporting events that permit wagering. •Manufacturers: Companies that produce goods used exclusively for gambling, such as slot machines, roulette wheels, or lottery terminals. •Supporting Products or Services: Companies that provide services in casinos that are fundamental to gambling operations, such as credit lines, consulting services, or gambling technology and technology support. •Ownership of a Gambling Company: The Company owns more than 20% of another company with gambling involvement. (When a company owns more than 50% of company with gambling involvement, KLD treats the gambling company as a consolidated subsidiary.)

	• Ownership by a Gambling Company: The Company is more than 50% owned by a company with gambling involvement.
MILITARY	• Manufacturers of Weapons or Weapons Systems: Companies that derive more than 2% of revenues from the sale of conventional weapons or weapons systems, or earned $50 million or more from the sale of conventional weapons or weapons systems, or earned $10 million or more from the sale of nuclear weapons or weapons systems. • Manufacturers of Components for Weapons or Weapons Systems: Companies that derive more than 2% of revenues from the sale of customized components for conventional weapons or weapons systems, or earned $50 million or more from the sale of customized components for conventional weapons or weapons systems, or earned $10 million or more from the sale of customized components for nuclear weapons or weapons systems. • Ownership of a Military Company: The Company owns more than 20% of another company with military involvement. (When a company owns more than 50% of company with military involvement, KLD treats the military company as a consolidated subsidiary.) • Ownership by a Military Company: The Company is more than 50% owned by a company with military involvement.
NUCLEAR POWER	• Ownership of Nuclear Power Plants: Companies that own nuclear power plants. • Ownership of a Nuclear Power Company: The Company owns more than 20% of another company with nuclear power involvement. (When a company owns more than 50% of company with nuclear power involvement, KLD treats the nuclear power company as a consolidated subsidiary.) • Ownership by a Nuclear Power Company: The Company is more than 50% owned by a company with nuclear power involvement.
TOBACCO	• Licensing: The Company Licenses its company or brand name to tobacco products. • Manufacturers: The Company produces tobacco products, including cigarettes, cigars, pipe tobacco, and smokeless tobacco products. • Retailers: The Company derives 15% or more of total revenues from the distribution (wholesale or retail) of tobacco products. • Manufacturers of Products Necessary for Production of Tobacco Products: The Company derives 15% or more of total revenues from the production and supply of raw materials and other products necessary for the production of tobacco products. • Ownership of a Tobacco Company: The Company owns more than 20% of another company with tobacco involvement. (When a company owns more than 50% of company with tobacco involvement, KLD treats the tobacco company as a consolidated subsidiary.) • Ownership by a Tobacco Company: The company is more than 50% owned by a company with tobacco involvement

Source: www.domini.com

[SNS Asset Management/ASN Bank Criteria]

Major	Minor	In detail
	Company Data(A1)	▪ Company Name, Address (Head Office), Home Country, Web site, (Sub-) Sector(MSCI), Description Business Activities
	Contact Details(A2)	▪ Person in Charge, Job, Division, Telephone and Fax Number, E-mail address
	Key Figure(A3)	▪ Market share, Turnover and sales, Number of employees
	Geographical representation of the company(A4)	▪ Region, Countries, Number of Employees, Sales by Geographic Region
	Relative size business units/ divisions/ subsidiaries/ joint ventures(A5)	▪ Unit, Number of Employees, Sales by Unit
Business Ethics	Code of conduct/ business principles (B1)	▪ Presence/absence ▪ Geographic reach ▪ Reach in terms of business units ▪ Transparency (internal/external) ▪ Presence key elements · Integrity · Corruption/Bribery · Respect of law/ Compliance · Transparency/ Openness · Equal Opportunity · Social responsibility · Environmental responsibility · Health and Safety ▪ Responsibility ▪ Monitoring/ Auditing/ Reporting compliance ▪ Concerns · Violation code/ Principles · Violation legislation key elements
	Corporate Governance (B2)	▪ Non-executive board members ▪ Committees preventing conflicts of interest · Audit · Remuneration · Nomination ▪ Composition of committees

Social Performance	Human Capital (internal) (C1)	▪ Human Resources policy · Insight · Geographical reach · Reach in terms of business units · Highest ranked responsible staff ▪ Equal rights policy · Sex · Disabled persons · Race · Religion · Employment of the disabled · Concerns : 1) Violation policy 2) Violation legislation ▪ Reflection background ▪ Affirmative action : Presence/ Absence ▪ Job classification system : Presence/ Absence ▪ Terms of employment & private/family life · Long-term contract of employment · Data temporary vs. fixed contracts ▪ Terms of employment & private/family life · Financial provision maternal/paternal leave · Financial provision child care · Training and education · Training and education open to all functions · Geographical reach ▪ Career Development · Career development open to all functions · Geografical reach · Delegation responsibilities · Geografical reach · Job satisfaction surveys · Geografical reach ▪ Layoffs · Policy to avoid direct/forced layoffs · Concerns : violation policy, violation legislation ▪ Trade Unions · Negotiations with independent trade unions · Geographical reach · Geographical reach · Concerns : violation policy, violation legislation ▪ Employee representation · Presence/absence · Geographical reach

		· In board of directors ▪ Health & Safety (policy and performance) · Health & safety policy and performance (i/e) · Geographical reach · Targets · Trend sick ratio · Geographical reach · Trends accidents · Geographical reach · Prevention programs · Reintegration programs · Concerns : violation policy, violation legislation
	Social and Ethical Accounting, Auditing and Reporting (C2)	▪ Social reporting · Extent · Geographical reach · Frequency · Targets · Historic performance data · Certification ▪ Social Audit · Internal/External (frequency) · Geographical reach ▪ Social accountability · Living up to standards (SA 8000)
	External social policy (Western Europe, North America) (C3)	▪ Charity/ sponsoring policy · Policy · Type of initiatives : Social NGOs, Environmental NGOs, Educational programs/institutions, Research programs/institutions, Sports programs/organizations, Cultural programs/ organizations ▪ Employment measures : presence/absence ▪ Community involvement · Local community development programs · Local economic development programs

	Social (C4) Strategy in risk countries	▪ Human rights · Claiming responsibility (i/e) · Assigning responsibilities (i/e) · Monitoring/auditing violation of human rights · Policy on prohibition of forced labor · Policy on prohibition of child labor · Concern : violation policy, violation legislation ▪ Labor condition · Improving labor conditions · Facilitating free association/bargaining · Compliance with minimum wages · Paying living wage · Compliance with legislation on working hours · Compensation of overtime · Regular/secure employment · Concerns : violation policy, violation legislation ▪ Community involvement : involvement in local communities ▪ Suppliers/contractors · Screening social performance · Policy on prohibition force/child labor · Concerns : violation policy, violation legislation

Environmental Performance	Strategy (D1)	▪ Environmental Policy · Presence/absence · Geographical reach · Reach in terms of business units · Policy statements : relevance corporate strategy, responsibility for impact by: operations, responsibility for impact by: suppliers/contractors, responsibility for impact by: products/services, external audits, report environmental performance internally, report environmental performance externally, beyond compliance, inform & consult, sustainability · Targets and Targets history · Concerns : violation policy, violation legislation ▪ Environmental Management system (EMS) · Presence/absence, intentions · Geographical reach · Reach in terms of business units · Level of certification · Geographical reach ▪ Responsibilities policy and performance · Staff level · employees ▪ Environmental audit · Presence/absence · Frequency internal audit · Frequency external audit · Geographical reach ▪ External environmental reporting · Presence/absence · Frequency · Reporting of fines/penalties/settlements · Verification ▪ Internal environmental communication · Promoting environmental awareness · Geographical reach · Organization ▪ External co-operation/commitment · Environmental charters/ declarations · Association/ working groups
	Product and service creation (D2)	▪ Innovation product/service creation process : presence/absence ▪ R&D investments : presence/absence ▪ Energy use · Replacing high with low-impact sources · Reduction ▪ Water use · Replacing high with low-impact sources

		· Reduction ▪ Waste disposal (production companies) · Reduction hazardous waste · Impact reduction hw · Reduction normal waste · Impact reduction ▪ Transport logistics (production companies) · Measures reducing impact : fuel, alternative means, monitoring distance, moving facilities, other ▪ Employment transport · Measures : variable working place, telecomm. Solutions, vehicles, public transport, car pooling, housing, other ▪ Office management and support services · Measures : purchase of office supplies, restaurants, office waste man., energy savings, water savings, other ▪ Environmental status of office buildings · Measures : energy, water, indoor climate ▪ Product/service creation ▪ Environmental Status of a Building (energy, water, climate efficiency) ▪ Impact by production
	Product/service use (D3)	▪ Low impact products/services · Low impact products/services · Portfolio significance · Design significance ▪ Eco-friendly products/services · Eco-friendly products/services · Portfolio significance · Design significance ▪ R&D investments : presence/absence ▪ Life Cycle Analysis : presence/absence ▪ Impact products/service use · transparency ▪ Packaging disposal · Change type packaging · Reduce total packaging
	Supplier/contractors (D4)	▪ Demand on suppliers/contractors · Presence/absence · Geographical reach · Monitoring compliance ▪ Purchasing renewable/recyclable/recycled materials · Measures presence/absence · Significance
	Other issues (D5)	

Source: SNS Evaluation Sheet

[INNOVEST Strategic Value Advisors' IVA (Intangible Value Assessment) Criteria]

Classification	In detail
Strategic Governance	• Strategic capability/direction • External Stakeholder Input/Advisory Boards • Shareholder Activism Response • Board Structure • Board/Management Diversity • Senior CSR/Social Officer • Social Factor in Compensation • Integration with Core Business • Consistency—All Operations/International • Performance Indicators and Targets/Accounting • Reporting/Disclosure/Transparency • Auditing • Social/Ethical Standards • Sustainability Charter Signatory/Council Member • Codes Signatory— Global Compact, OECD, Child Labor, UND Human Rights, SA 8000, ETI, ILO, etc. • Investment Policy/Screening • Charitable Giving Policy and performance • Bribery Policy/Enforcement • Product Social/Ethical Impact • Boycotts • Claims/Litigation • Product Certification/Labels • Safety/Quality Issues • IPRs – Patents
Human Capital	• Employee Retention Rate • Work Policies—Job Sharing, Flexible Schedule/Location, etc. • Training and Knowledge Dissemination • Benefits—Health Care, Wellness Programs, Child Care, etc. • Monitoring of employee satisfaction rates • Health & Safety Policy/Auditing • Health & Safety Performance—Absentee and Injury Rates, etc. • Access to Management/Grievance Procedures/Whistleblower Protection • Union Policy/Issues • Claims/Litigation/Fines
Stakeholder Capital	• Community Support Programs—Volunteer, Local Development, etc. • Policy on Using Local Suppliers/Contractors • Plant Closure Policy/Impact • Disaster Planning/Local Approval/Third Party Audit

	• Controversy/Protests/Claims/Litigation/Fines • Awards • Stakeholder Engagement Activities/Stakeholder Access • Supplier Screening Policy—CSR Performance, Ethnicity, Gender, Size, etc. • Required Code of Conduct • Supplier Training and Development Programs • Supplier Social Audits • Third Party Review • Developing Country (DC) Policy/Programs—Benefit Sharing, Local Input, etc. • DC Strategy/Market Dev.—Investment, Technology/Skills Transfer, etc. • DC Share of Production/DC Share of Revenue • Advertising Policy/Respect for Local Culture • Controversy/Protests/Claims/Litigation/Fines • Implementation of policies relating to human rights, child labour, forced labour, equal opportunities • Negative Screen: · Weapons – involvement in manufacture or sale of armaments, weapons systems or critical components thereof. · Tobacco – involvement in manufacture, distribution or sale of tobacco products. · Nuclear Power – involvement in ownership or operation of nuclear power plants, uranium mining, reprocessing of nuclear fuel, manufacture of nuclear power facilities. · GMOs – involvement in commercial release of GMOs and/or xenotransplantation research. · Contraceptives – involvement in the production, sale or distribution of contraceptives. · Animal Testing – involvement in provision of animal testing services or use of primates, commercialization of xenotransplantation. Animal testing used for development of cosmetics, household products, food additives, chemicals for non-medical products. · Alcohol – involvement in production, sale and/or distribution of alcohol. · Pornography – involvement in production or distribution of pornographic material, or ownership/management of ‘adult entertainment’ · Gambling – involvement in management or ownership of gambling facilities. · Other – e.g Climate change, deforestation, ozone depleting substances, pvc, intensive farming
Environment	• Policies • Integration with Core Business • Profitability Linkages • Consistency - All Operations/ International • Board Structure • Senior Environmental Officer Level • Environmental Factor in Compensation • Number and Qualifications of Environmental staff • ISO 14000 or other certified EMS • Environmental Performance Indicators • Audit Existence • Audit Adequacy • Audit Frequency • Audit Impartiality • Environmental Reporting • Environmental Accounting

	• Environmental Training & Development • Use of CERES/GRI guidelines • Other outside code • Voluntary EPA programs • Life cycle analysis • Suppliers - environmental screen • Eco-labels • Contaminated Site Liabilities • Other Historic Liabilities • Spills and Releases • Regulatory Compliance* scores include NYU data • Toxic Emissions • Hazardous Waste • Other Operating Risk • Resource Use Efficiency/Recycling • Energy Efficiency • Market Risk - Including environmental sensitivities of customers • Regulatory/Legal Risk • Other Emissions Risk • Other Sustainability Risk - Operations • Performance Improvement Vector • Strategic Competence • Environmental Opportunity • Environmental Business Development Strategy/ Planning • Organizational Structure • Environmental Sensitivity of Geographic Regions Served • Environmental Sensitivity of Demographic Groups Served • Phase-out Risk of Products and Services • Environmental Improvement Potential • Environmental Positioning Within Sector • Current Environmental Businesses • Environmental Businesses Under Development

Source: http//www.innovest.org

[2002 GRI Sustainability Report Guidelines' Indicators]

Classification	Items	In detail	
		Core Indicators	Additional Indicators
Economic Performance Indicator	Customers	▪ EC1. Net sales. ▪ EC2. Geographic breakdown of markets. For each product or product range, disclose national market share by country where this is 25% or more. Disclose market share and sales for each country where national sales represent 5% or more of GDP.	
	Suppliers	▪ EC3. Cost of all goods, materials, and services purchased. ▪ EC4. Percentage of contracts that were paid in accordance with agreed terms, excluding agreed penalty arrangements. Terms may include conditions such as scheduling of payments, form of payment, or other conditions. This indicator is the percent of contracts that were paid according to terms, regardless of the details of the terms.	▪ EC11. Supplier breakdown by organization and country. List all suppliers from which purchases in the reporting period represent 10% or more of total purchases in that period. Also identify all countries where total purchasing represents 5% or more of GDP.
	Employees	▪ EC5. Total payroll and benefits (including wages, pension, other benefits, and redundancy payments) broken down by country or region. This remuneration should refer to current payments and not include future commitments. (Note: Indicator LA9 on training also offers information on one aspect of the organization's investment in human capital.)	
	Provider of Capitals	▪ EC6. Distributions to providers of capital broken down by interest on debt and borrowings, and dividends on all classes of shares, with any arrears of preferred dividends to be disclosed. This includes all forms of debt and borrowings, not only long-term debt. ▪ EC7. Increase/decrease in retained earnings at end of period. (Note: the information contained in the profile section (2.1–2.8) enables calculation of several measures, including ROACE (Return on Average Capital Employed).	
	Public Sectors	▪ EC8. Total sum of taxes of all types paid broken down by country. ▪ EC9. Subsidies received broken down by country or region. This refers to grants, tax relief, and other types of financial benefits that do not represent a transaction of goods and services. Explain definitions used for types of groups. ▪ EC10. Donations to community, civil society, and other groups broken down in terms of cash and in-kind donations per type of group.	▪ EC12. Total spent on non-core business infrastructure development. This is infrastructure built outside the main business activities of the reporting entity such as a school, or hospital for employees and their families.
	Indirect Economic Effect		▪ EC13. The organization's indirect economic impacts. Identify major externalities associated with the reporting organization's products and services.
Environmental Performance Indicator	Materials	▪ EN1. Total materials use other than water, by type. Provide definitions used for types of materials. Report in tonnes, kilograms, or volume. ▪ EN2. Percentage of materials used that are wastes (processed or unprocessed) from sources external to the reporting organization. ▪ Refers to both post-consumer recycled material and waste from industrial sources.	

		Report in tonnes, kilograms, or volume.	
	Energy	▪ EN3. Direct energy use segmented by primary source. Report on all energy sources used by the reporting organization for its own operations as well as for the production and delivery of energy products (e.g., electricity or heat) to other organizations. Report in joules. ▪ EN4. Indirect energy use. Report on all energy used to produce and deliver energy products purchased by the reporting organization (e.g., electricity or heat). Report in joules.	▪ EN17. Initiatives to use renewable energy sources and to increase energy efficiency. ▪ EN18. Energy consumption footprint (i.e., annualized lifetime energy requirements) of major products. Report in joules. ▪ EN19. Other indirect (upstream/downstream) energy use and implications, such as organizational travel, product lifecycle management, and use of energy-intensive materials.
	Water	▪EN5. Total water use.	▪ EN20.Water sources and related ecosystems/habitats significantly affected by use of water. Include Ramsar-listed wetlands and the overall contribution to resulting environmental trends. ▪ EN21. Annual withdrawals of ground and surface water as a percent of annual renewable quantity of water available from the sources. Breakdown by region. ▪ EN22. Total recycling and reuse of water. Include wastewater and other used water (e.g., cooling water).
	Biodiversity	▪ EN6. Location and size of land owned, leased, or managed in biodiversity-rich habitats. Further guidance on biodiversity-rich habitats may be found at www.globalreporting.org (forthcoming). ▪ EN7. Description of the major impacts on biodiversity associated with activities and/or products and services in terrestrial, freshwater, and marine environments.	▪ EN23. Total amount of land owned, leased, or managed for production activities or extractive use. ▪ EN24. Amount of impermeable surface as a percentage of land purchased or leased. ▪ EN25. Impacts of activities and operations on protected and sensitive areas. (e.g., IUCN protected area categories 1–4, world heritage sites, and biosphere reserves). ▪ EN26. Changes to natural habitats resulting from activities and operations and percentage of habitat protected or restored. Identify type of habitat affected and its status. ▪ EN27. Objectives, programmes, and targets for protecting and restoring native ecosystems and species in degraded areas. ▪ EN28. Number of IUCN Red List species with habitats in areas affected by operations. ▪ EN29. Business units currently operating or planning operations in or around protected or sensitive areas.
	Emission, Effluent, and Wastes	▪ EN8. Greenhouse gas emissions. (CO2, CH4, N2O, HFCs, PFCs, SF6). Report separate subtotals for each gas in tonnes and in tonnes of CO2 equivalent for the following: • direct emissions from sources owned or controlled by the reporting entity • indirect emissions from imported electricity heat or steam See WRI-WBCSD Greenhouse Gas Protocol. ▪ EN9. Use and emissions of ozone-depleting substances. Report each figure separately in accordance with Montreal Protocol Annexes A, B, C, and E in tonnes of CFC-11 equivalents (ozone-depleting potential). ▪ EN10. NOx, SOx, and other significant air emissions by type. Include emissions of	▪ EN30. Other relevant indirect greenhouse gas emissions. (CO2, CH4, N2O, HFCs, PFCs, SF6). Refers to emissions that are a consequence of the activities of the reporting entity, but occur from sources owned or controlled by another entity. Report in tonnes of gas and tonnes of CO2 equivalent. See WRI-WBCSD Greenhouse Gas Protocol. ▪ EN31. All production, transport, import, or export of any waste deemed “hazardous” under the terms of the Basel Convention Annex I, II, III, and VIII. ▪ EN32. Water sources and related ecosystems/habitats significantly affected by discharges of water and runoff. Include Ramsar-listed wetlands and the overall contribution to resulting environmental

			substances regulated under: • local laws and regulations • Stockholm POPs Convention (Annex A, B, and C)– persistent organic pollutants • Rotterdam Convention on Prior Informed Consent (PIC) • Helsinki, Sofia, and Geneva Protocols to the Convention on Long-Range Trans-boundary Air Pollution ▪ EN11. Total amount of waste by type and destination. "Destination" refers to the method by which waste is treated, including composting, reuse, recycling, recovery, incineration, or landfilling. Explain type of classification method and estimation method. ▪ EN12. Significant discharges to water by type. See GRI Water Protocol. ▪ EN13. Significant spills of chemicals, oils, and fuels in terms of total number and total volume. Significance is defined in terms of both the size of the spill and impact on the surrounding environment.	trends. See GRI Water Protocol.
		Suppliers		▪ EN33. Performance of suppliers relative to environmental components of programs and procedures described in response to Governance Structure and Management Systems section (Section 3.16).
		Product and Services	▪ EN14. Significant environmental impacts of principal products and services. Describe and quantify where relevant. ▪ EN15. Percentage of the weight of products sold that is reclaimable at the end of the products' useful life and percentage that is actually reclaimed. "Reclaimable" refers to either the recycling or reuse of the product materials or components.	
		Compliance	▪ EN16. Incidents of and fines for non-compliance with all applicable international declarations/conventions/treaties, and national, sub-national, regional, and local regulations associated with environmental issues. Explain in terms of countries of operation.	
		Transport		▪ EN34. Significant environmental impacts of transportation used for logistical purposes.
		Overall		▪ EN35. Total environmental expenditures by type. Explain definitions used for types of expenditures.
Social Performance Indicators	Labor Practi	Employment	▪ LA1. Breakdown of workforce, where possible, by region/country, status (employee/non-employee), employment type (full time/part time), and by employment contract (indefinite or permanent/fixed term or temporary). Also identify workforce retained in conjunction with other employers (temporary agency workers or workers in co-employment relationships), segmented by region/country. ▪ LA2. Net employment creation and average turnover segmented by region/country.	▪ LA12. Employee benefits beyond those legally mandated. (e.g., contributions to health care, disability, maternity, education, and retirement).
		Labor/Management Relations	▪ LA3. Percentage of employees represented by independent trade union organizations or other bona fide employee representatives broken down geographically OR percentage of employees covered by collective bargaining agreements broken down by region/country. ▪ LA4. Policy and procedures involving information, consultation, and negotiation with employees over changes in the reporting organization's operations (e.g.,	▪ LA13. Provision for formal worker representation in decision-making or management, including corporate governance.

	ce and Decent Work		restructuring).	
		Health and Safety	▪ A5. Practices on recording and notification of occupational accidents and diseases, and how they relate to the ILO Code of Practice on Recording and Notification of Occupational Accidents and Diseases. ▪ LA6. Description of formal joint health and safety committees comprising management and worker representatives and proportion of workforce covered by any such committees. ▪ LA7. Standard injury, lost day, and absentee rates and number of work-related fatalities (including subcontracted workers). ▪ LA8. Description of policies or	▪ LA14. Evidence of substantial compliance with the ILO Guidelines for Occupational Health Management Systems. ▪ LA15. Description of formal agreements with trade unions or other bona fide employee representatives covering health and safety at work and proportion of the workforce covered by any such agreements.
		Training and Education	▪ LA9. Average hours of training per year per employee by category of employee. (e.g., senior management, middle management, professional, technical, administrative, production, and maintenance).	▪ LA16. Description of programs to support the continued employability of employees and to manage career endings. ▪ LA17. Specific policies and programs for skills management or for lifelong learning.
		Diversity and Opportunity	▪ LA10. Description of equal opportunity policies or programs, as well as monitoring systems to ensure compliance and results of monitoring. Equal opportunity policies may address workplace harassment and affirmative action relative to historical patterns of discrimination. ▪ LA11. Composition of senior management and corporate governance bodies (including the board of directors), including female/male ratio and other indicators of diversity as culturally appropriate.	
	Human Rights	Strategy and Management	▪ HR1. Description of policies, guidelines, corporate structure, and procedures to deal with all aspects of human rights relevant to operations, including monitoring mechanisms and results. State how policies relate to existing international standards such as the Universal Declaration and the Fundamental Human Rights Conventions of the ILO. ▪ HR2. Evidence of consideration of human rights impacts as part of investment and procurement decisions, including selection of suppliers/contractors. ▪ HR3. Description of policies and procedures to evaluate and address human rights performance within the supply chain and contractors, including monitoring systems and results of monitoring. "Human rights performance" refers to the aspects of human rights identified as reporting aspects in the GRI performance indicators.	▪ HR8. Employee training on policies and practices concerning all aspects of human rights relevant to operations. Include type of training, number of employees trained, and average training duration.
		Non-discrimination	▪ HR4. Description of global policy and procedures/programs preventing all forms of discrimination in operations, including monitoring systems and results of monitoring.	
		Freedom of Association & Collective Bargaining	▪ HR5. Description of freedom of association policy and extent to which this policy is universally applied independent of local laws, as well as description of procedures/ programs to address this issue.	
		Child Labor	▪ HR6. Description of policy excluding child labor as defined by the ILO Convention 138 and extent to which this policy is visibly stated and applied, as well as description of procedures/ programs to address this issue, including monitoring systems and results of monitoring.	
		Forced and Compulsory	▪ HR7. Description of policy to prevent forced and compulsory labor and extent to	

		Labor	which this policy is visibly stated and applied as well as description of procedures/programs to address this issue, including monitoring systems and results of monitoring. See ILO Convention No. 29, Article 2.	
		Disciplinary Practices		▪ HR9. Description of appeal practices, including, but not limited to, human rights issues. Describe the representation and appeals process. ▪ HR10. Description of non-retaliation policy and effective, confidential employee grievance system (including, but not limited to, its impact on human rights).
		Security Practices		▪ HR11. Human rights training for security personnel. Include type of training, number of persons trained, and average training duration.
		Indigenous Practices		▪ HR12. Description of policies, guidelines, and procedures to address the needs of indigenous people. This includes indigenous people in the workforce and in communities where the organization currently operates or intends to operate. ▪ HR13. Description of jointly managed community grievance mechanisms/authority. ▪ HR14. Share of operating revenues from the area of operations that are redistributed to local communities.
	Society	Community	▪ SO1. Description of policies to manage impacts on communities in areas affected by activities, as well as description of procedures/programs to address this issue, including monitoring systems and results of monitoring. Include explanation of procedures for identifying and engaging in dialogue with community stakeholders.	▪ SO4. Awards received relevant to social, ethical, and environmental performance.
		Bribery and Corruption	▪ SO2. Description of the policy, procedures/management systems, and compliance mechanisms for organizations and employees addressing bribery and corruption. Include a description of how the organization meets the requirements of the OECD Convention on Combating Bribery.	
		Political Contribution	▪ SO3. Description of policy, procedures/management systems, and compliance mechanisms for managing political lobbying and contributions.	▪ SO5. Amount of money paid to political parties and institutions whose prime function is to fund political parties or their candidates.
		Competition and Pricing		▪ SO6. Court decisions regarding cases pertaining to anti-trust and monopoly regulations. ▪ SO7. Description of policy, procedures/management systems, and compliance mechanisms for preventing anti-competitive behavior.
	Product Resp	Customer Health and Safety	▪ PR1. Description of policy for preserving customer health and safety during use of products and services, and extent to which this policy is visibly stated and applied, as well as description of procedures/programs to address this issue, including monitoring systems and results of monitoring. Explain rationale for any use of multiple standards in marketing and sales of products.	▪ PR4. Number and type of instances of non-compliance with regulations concerning customer health and safety, including the penalties and fines assessed for these breaches. ▪ PR5. Number of complaints upheld by regulatory or similar official bodies to oversee or regulate the health and safety of products and services. ▪ PR6. Voluntary code compliance, product labels or awards with respect to social and/or environmental responsibility that the reporter is qualified to use or has received. Include explanation of the process and criteria involved.
		Product and Services	▪ PR2. Description of policy, procedures/management systems, and compliance mechanisms related to product information and labeling.	▪ PR7. Number and type of instances of non-compliance with regulations concerning product information and labeling, including any penalties or fines assessed for these breaches. ▪ PR8. Description of policy, procedures/management systems, and compliance

	o n s i b i l i t y			mechanisms related to customer satisfaction including results of surveys measuring customer satisfaction. Identify geographic areas covered by policy.
		Advertising		▪ PR9. Description of policies, procedures/management systems, and compliance mechanisms for adherence to standards and voluntary codes related to advertising. Identify geographic areas covered by policy. ▪ PR10. Number and types of breaches of advertising and marketing regulations.
		Respect for Privacy	▪ PR3. Description of policy, procedures/management systems, and compliance mechanisms for consumer privacy. Identify geographic areas covered by policy.	▪ PR11. Number of substantiated complaints regarding breaches of consumer privacy.

Source: 2002 GRI Sustainability Report Guideline

Appendix B. CSM Checklists

Ⅰ. Economy

Classifications		Checklists in detail
1. Leadership and Management Philosophy	1.1 CEO Commitment	·The CEO has announced his point of view regarding key economic, environmental, social issues through internal and external activities such as New Year's Message, Executive and Strategic Meetings, etc.
		·The CEO and the management staff regularly have an education and discussion on key economic, environmental, social issues related to the firm.
	1.2 Vision and Mission	·The firm's vision and mission provide the basic direction of its strategy.
	1.3 Mgt. or Business Principle	·Management & Business principles are required for achieving the Vision and Mission.
	1.4 Code of ethics	·The 'Code of Ethics' reflects upon issues such as the following: anti corruption and bribery, discrimination(sex, ,regionalism, etc), confidentiality of information, Insider trading/dealing, environment, health and safety
		·The 'Code of Ethics' reaches its subsidiaries, external service partners as well as its overseas partners in joint ventures.
		·**The** Department or the Help Desk which is in charge of implementation of the 'Code of Ethics,' are operated efficiently.
		·The 'Code of Ethics' is partially based on performance evaluation and compensation program of management and employees.
		·Penalties given to employees (e.g., punishment, fines, dismiss etc.) based on code of ethics are recognized to be reasonable.
		·All the programs related to the 'Code of Ethics' are regularly verified and assured by a third party.
2. Corporate Governance	2.1 Structure of Board of Director (BOD)	·The share of outside executive of BOD (Board of Director) is going up beyond at least the law.
		·Diversity such as foreigners and women executives of the BOD, etc is being pursued.
		·Experts related to environmental and NGO issues are appointed as a member of the BOD.
	2.2 Operation and Function of BOD	·Guideline on operations regarding BOD including the principle of getting ready to participate actively in the global economy as a global company.
		·Together with financial issues, the issues related to the triple bottom line, namely economy, environment, society have been discussed in the BOD.
		·Participation of outside executive of BOD is proactive; the percentage (number) of attendance of BOD, statement of a written or verbal opinion to BOD etc.
3. Strategic Management and Planning		·Mid-term strategic management and planning have proactively considered issues related to the triple bottom line for its sustainability.
		·Mid-term strategic management and planning are established based on systematic analysis such as Sustainability SWOT, Sensitivity, Scenario techniques
		·It regularly conducts benchmarking on the 'State of the Art,' of globally excellent companies in sustainability perspectives.
		·It proactively seeks cooperation with suppliers, external service companies, customers, etc through the partnership.
		·FINEX, Strip Casting, environmental friendly products, benefit sharing etc., which it has recently achieved are recognized by the management and employees.

4. Risk Management	·It identifies and maintains financial and non-financial risk factors regularly according to business atmosphere.
	·It periodically monitors its activities for meeting the challenges pertaining to financial and non-financial issues.
	·It has a crisis/emergency plan.
	·Its management and BOD periodically report upon the results of their monitoring of financial and non-financial risk factors.
5. Stakeholders Engagement	·The Person or Department which is in charge of stakeholder engagement operates efficiently.
	·Stakeholder analyses such as identification of its core stakeholders, its impacts and importance on the firm, etc are conducted regularly.
	·It has taken efforts to search for a tool for efficient communication with each stakeholder.
	·It monitors activities of its core stakeholders. It measures the performance on management on its core stakeholders.
	·The results have been reported to the management and the BOD.
	·Its decision-making process considers or reflects the company's sustainability point of view on all sustainability issues of stakeholders.
6. Finance	·It prefers long-term strategic management objectives to short-term financial performance.
	·The financial performance such as sales, net profits, the liquidity of assets, access to capital, etc. is highly sound and robust.
	·The financial information is highly transparent.
	·It makes proactive use of subsidies, external support funds, tax reductions, etc for management innovation, reduction of environmental pollutants, improving the company's social responsibility.
	·It always monitors financial issues, and measures up financial performance at least every month..
7. Investor Relation	·A wide range of materials (e.g., analyst presentations, websites, reports, cast studies, speeches etc.) are provided to communicate with and educate analysts and investors about sustainability issues and the relevance to the firm's strategy/bottom line.
	·Perception study of investors is regularly conducted.
	·The number of IR (investor relation) is suitable for letting its business activities or performance know.
	·IR activities are enough to enhance management transparency.
8. Public Relation and Communication	·The structure of communication policy is systematic.
	·The personnel and division in charge of communication operate efficiently.
	·The communication system of the company is efficient.
	·Financial and non financial performances have been appropriately provided in the course of public relations and other communications.
	·The firm uses its economic, environmental, and social performance for public relations.
	·With the help of its public relations and other communications tools, awareness of its key stakeholders has been positive regarding the firm.
9. Procurement	·It proactively cooperates with suppliers including raw material's suppliers via strategic alliances etc.
	·It regularly assesses suppliers, external service companies, so as to not rely upon a specific supplier for its supplies.
	·The criteria for procurement include environmental and social factors together with traditional factors such as finance, technology, quality, etc.
	·The selection criteria for procurement and performance of external service companies are strictly applied with regard to working conditions and quality of products produced.
10. Operational and Process Control	·The process is so flexible that it can cope with the rapid changes of economic and business circumstances.
	·It encourages employees' ideas based on evaluation and proactively testing their ideas for improved management and process control for efficiency of its processes and

		overall productivity
		・Its logistics for raw materials supply, production processes, product distribution, etc are designed to seek to achieve optimal efficiency in economic, environmental, and social perspectives.
11. Product Control (Quality and R&D)		・Total Quality Management system based on international standards like ISO 9000 series contributes to improvement of products and processes.
		・It continuously identifies market's needs and expectations regarding new products and applies them to its product development strategy.
		・It considers economic, environmental, and social sustainability when it develops new products and improves product quality.
12. Customer Satisfaction		・It strives to procure a wide range of customers for its products so as to assure a stable demand for them.
		・It does not do business with customers who violate the laws such as finance, environment, human rights, etc.
		・Customers are systematically managed through tools such as: Customer DB in all corporate dimensions, integration of various channel, operation of Help Desk, etc.
		・It monitors systematically the responses on customer satisfaction.
13. Management Review	Performance Measurement	・The system is systematic for performance measurement: tangible/intangible performance measurement, comparability with KPIs, reflection of strategic management and planning.
		・It properly considers financial and non-financial perspectives.
	Reporting	・Information about its financial and non-financial performance is provided to its various stakeholders.
		・It uses various tools such as annual reports, environment and sustainability reports, WebPages, etc to present financial and non-financial performance reporting.
		・Its financial and non-financial performance are verified and assured by a third party.
		・Its financial and non-financial performance is regularly reported to management and to the Board of Directors.

Ⅱ. Environment

Classifications		Checklists in Detail
1. Environmental Policy and Management		･Its environmental policy reflects the following: international guideline, domestic and foreign environmental laws, environmental impacts of product and services, opinions of core stakeholders, etc.
		･Its environmental policy engages subsidiary companies, joint ventures including overseas local companies, external service partner, , etc.
		･It has detailed guidelines (including manuals, procedures, responsibility and authority action plans, etc.) on environmental objectives and target, monitoring, and audit, etc.
		･It sets environmental objectives and target and conducts monitoring and auditing every year in accordance with environmental policy and related guidelines.
		･It establishes strategy to achieve environmental objectives and targets.
		･It has personnel and an organization, which are wholly in charge of environmental management of at the corporate level.
		･The communication among divisions, particularly between the headquarters and the environmental staff division of both steel works is carried out smoothly.
		･International environmental management systems such asISO 14001 etc contribute to the improvement of processes and environment management performance.
		･The Environmental management systems apply to the overall corporate operations, including environmentally related division.
2. Control	2.1 Procurement of raw materials and efficiency	･It strives to improve efficient usage of raw materials.
		･It strives to use reused and recycled materials.
	2.2 Energy and Water Efficiency	･It strives to improve efficient usage of energy and water.
	2.3 Climate Change	･It recognizes issues regarding climate change as a responsibility of management.
		･It has a mid and long –term strategy to reduce CO_2 emissions.
	2.4 Environmental Pollutants Emission	･Emission of air pollutants such as SO_x, NO_x, Dust, CO_2, etc has been reduced continuously.
		･Effluent of water pollutants has been reduced continuously.
		･Discharge of soil pollutants has been reduced continuously.
		･Discharge of wastes has been reduced continuously.
	2.5 Environmental Friendly Product and Cleaner Production Process	･The environmental division, the technology development division, the marketing division, etc work together effectively.
		･It strives to develop environmentally friendly products.
		･It strives to develop and utilize cleaner production processes.
		･Cleaner production is based on (sustainable) competitive advantage; this is central to the policy of the company.
	2.6 Supplier and External Service Partner	･When it selects supplier and external service partner, it considers the environment seriously.

		·It supports supplier and external service partner like technology transfer, certification, etc. in order to enhance their environment
		·It manages procedures such as monitoring and performance evaluations systematically.
		·It communicates regularly with external service partners.
	2.7 Environmental Stakeholder Management	·It systematically responds to stakeholder concerns related to the environment.
		·It strives to proactively encourage y engagement of a wide range of stakeholders for environment management.
	2.8 Environmental Accident, suit, punishment and fine, etc	·It is proactive with regard to anticipating and proactively abiding by environmental regulations..
		·It considers all of its environmental issues related to key environmental regulations and those issues reported in the press as key management responsibilities.
3. Monitoring and Environmental Performance Measuring		·It monitors environmental performance at corporate level by itself and via third parties.
		·It measures environmental management performance as an indicator for integrating environmental conditions, management performance, and operational indicators, etc.
		·It strives to develop environmental performance indicators according to changing business circumstances.
4. Environmental Performance Reporting & Management Review		·Information about its environmental management performance is provided for its stakeholders
		·It uses tools such as annual reports, environmental and sustainability reports, WebPages, etc to present information about its environmental performance to its stakeholders.
		·Its environmental performance is verified and assured by an independent third party.
		·It periodically conducts stakeholder awareness or satisfaction surveys regarding environmental management activities and corporate performance.
		·It reports on environmental management activities and performance to the relevant divisions and committees..

Ⅲ. Society

Classifications		Checklists in Detail
1. Social Responsibility Policy		·Its social policy reflects the following: international guidelines, product and service related social responsibilities, philanthropic activities, opinion of core stakeholders, etc.
		·Its social responsibility consists of human rights and labor practices (human rights, non-discrimination, safety and health), human resource management(talent attraction and retention, education and training), local community (contribution to local community development)
		·Its social policy applies to its subsidiary companies, joint ventures including oversea local companies, external service partner, , etc
		·It has detailed guidelines (including manuals, procedures responsibilities and authority, action plans, etc.) on social objectives and target, monitoring, and auditing and reporting.
		·It sets social objectives and targets, and conducts monitoring and audits every year in accordance with social policy and related guidelines.
		·It establishes strategy to achieve social objectives and targets.
		·It has personnel and organization which is wholly in charge of social management at overall corporate level.
		·It systematically manages stakeholder relations with regard to social issues.
		·It abides by international guidelines regarding labor and human rights.
		·The communication among divisions is carried out smoothly to help to ensure achievement of its social responsibility.
2. Human Right		·A guideline regarding Human rights including forced labor, child labor prohibition etc. is applied throughout the corporation including its subsidiary companies, and joint ventures, including its oversea local companies and external service partner.
		·The principle of diversity such female/male ratio, region, human species, etc is applied to the corporate including subsidiary company, joint ventures including oversea local company, external service partner, etc.
		·It is provides equal opportunities to males and females for employment..
		·It provides equal opportunity for employment without distinction of academic background, region, etc.
		·It takes care of disabled people in its employment and personnel policy.
3. Labor Practice	3.1 Employee Relation	·It maintains smooth relationships between labor and management.
		·It strives to develop a wide range of measures and systems in order to maintain smooth relationships between labor and management.
	3.2 Welfare of Management	·It provides various welfare benefit systems for its managers and employees.
		·The needs and complaints of employees are addressed systematically and efficiently by the management.
	3.3 Health and Safety	·Health and Safety management in accordance with OHSAS 18000 and SA 8000 is embedded and operated systematically and consistently..
		·A wide range of health and safety programs have been implemented and are being continuously improved.
4. Human Resource Management	4.1 Employment and mgt.	·Its personnel system is efficiently operated to employ and manage the human resources of each employee.
		·Incentives are used to help to ensure that skilled workers to not frequently change jobs. .
		·It strives for stability of employment.
		·The personnel evaluation of the employees is objective and systematic in all divisions.
		·MBO of each employee and division is consistent with the intention of the company.
		·Surveys regarding employee satisfaction are conducted periodically and systematically.

		·It encourages morale of its employees through stock options, profit sharing, financial information sharing, involvement with management decision-making, etc
	4.2 Education and Training	·It invests continuously in the education and training system for career development of its managers and employees.
		·Its education and training programs are systematically linked with the work of the employees.
		·All the employees share the knowledge through the company's Knowledge management system.
5. Local Community	5.1 Local Community Economy Development	·If possible, it strives to contract external service partners in the region in which diverse facilities are operated.
	5.2 Philanthropy & Sponsorship	·It contributes proactively to local communities through focused philanthropy and sponsorship.
		·Philanthropy and sponsorship are consistent with its strategic direction.
	5.3 Partnership	·It strives to establish a partnership with local community for maintaining smooth relationships.
6. Social Performance Reporting & Communication		·Reports of its environmental management performance is provided for its stakeholders
		·It uses appropriate tools such as annual reports, environment and sustainability report, webpage, etc to present environmental performance information for its stakeholders.
		·Its social responsibility performance is verified and assured by an independent, third party.
		·It strives to develop social responsibility performance indicators according to changing business circumstances.
		·It periodically conducts stakeholder awareness or satisfaction surveys with respect to social responsibility activity and performance.
		·It reports upon social responsibility activities and performance to all appropriate divisions and committees..

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